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# Pricing and Marketing Practices For North Dakota Durum and HRS Wheat: 1990 Crop Year

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## *Highlights*

*Cash grain markets have premiums and discounts for quality characteristics that are important to individual market participants. Premiums and discounts are determined by and change with the supply and demand for those quality characteristics. This seventh annual report contains the results of the 1990 survey of the pricing and marketing practices of North Dakota country elevators for durum and hard red spring (HRS) wheat. The results show that the HRS wheat protein levels fell from their 1988 and 1989 highs, and that the protein premium for HRS wheat increased over the past year. Discounts have generally become less since 1988 for both HRS and durum wheat.*

# PRICING AND MARKETING PRACTICES FOR NORTH DAKOTA DURUM AND HRS WHEAT 1990 CROP YEAR

Daniel J. Scherping and William W. Wilson*

## Introduction

The value of durum and hard red spring wheat (HRS) is comprised in part by their quality characteristics. The value of individual quality characteristics vary through time, depending on the supply and demand for that characteristic. The cash market conveys the value of each characteristic as a premium or discount.

Premiums and discounts are determined among individual market participants. Premium and discount schedules change frequently and differ with location, time, and the current and perceived market conditions. Thus, explicit premiums and discounts rarely are published. However, market participants should understand premiums and discounts and how they have changed through time. Because of their importance and because they seldom are published, the Department of Agricultural Economics began surveying North Dakota country elevators in 1984 about pricing and marketing practices. The previous surveys, listed in the reference, can be obtained from the Department of Agricultural Economics, North Dakota State University.

This report contains the results of the December 1990 survey, which is compared to the previous years. The following sections on general characteristics of participating elevators, premiums and discounts, the economics of dockage removal, and the summary and conclusions are based on the tables and figures that are contained in Appendixes A and B, respectively. The survey questionnaire is contained in Appendix C. The discussion is kept brief and illuminating only major points since the tables and figures are self-explanatory. The reader is encouraged to examine the tables and figures to formulate ones own opinion.

## General Characteristics of Participating Elevators

Questionnaires were sent to 489 country elevators in North Dakota, and 75 usable surveys were returned. The respondent rate was 15 percent or about one-half of the previous years (Table 1). Of the responding elevators, 71 percent were classified as cooperatives - Harvest States line elevators are included in this group. The remaining 29 percent were investor-owned elevators, similar to 1989 results (Table 2).

Elevators with a load-out capacity of 7 to 26 cars per day represented 48 percent of the elevators; and 84 percent of the elevators had a load-out capacity of 7 or more cars per day (Table 3). The majority of the elevators had a competitor within 6 to 10 miles (Table 4). The storage capacity of the responding elevators increased

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from 1989. Of the responding elevators, 82 percent had a storage capacity of 300,000 bushels or more (Table 5).

Harvest States continues to be the largest purchaser of durum and HRS wheat. Benson-Quinn and Atwood Larson also continue as the second and third largest purchasers of durum and HRS wheat (Table 7). The market share held by individual purchasing companies and cooperatives varied greatly across crop reporting districts (CRD - Figure 1) from 1989 (Table 8), possibly because of the lower number of responding elevators.

Cargill and Continental lost market share in both durum and HRS wheat from investor-owned elevators, while Peavey gained in both commodities from the previous year. The three commission firms (Atwood Larson, Benson-Quinn, and Kellogg) and Peavey dominated the purchases from investor-owned elevators, comprising 79 percent and 76 percent of the market share for durum and HRS wheat, respectively. Harvest States purchased 48 percent of the durum and 46 percent of the HRS wheat from cooperative elevators. Benson-Quinn had the second largest market share in both commodities from cooperative elevators, with 22 percent of the durum and 20 percent of the HRS market share (Table 9).

Commission companies' and track buyers' market share from elevators with storage capacity under 299,000 bushels varied greatly from 1989, probably because of the low number of responding elevators. Harvest States had roughly one-third of the business from elevators with storage capacity greater than 300,000 bushels. Benson-Quinn and Atwood Larson held the second and third largest market share in both commodities from elevators with storage capacity greater than 300,000 bushels, except for HRS wheat from elevators with a storage capacity greater than one million bushels. Cargill and firms comprising the "Other" category each held 15 percent of the HRS wheat market share from elevators with a storage capacity greater than one million bushels (Table 10). The large percent of HRS wheat sold to firms in the "Other" category may result from larger elevators being able to sell wheat to firms that are not traditional outlets for grain.

Harvest States had the majority market share for all the different load-out capacities. Atwood Larson and Benson-Quinn usually had the next largest market share. Peavey and Kellogg had 19 percent of the durum and HRS wheat market share, respectively, from elevators with a load-out capacity of 6 cars per day or less. Elevators with a load-out capacity of 6 cars per day or less also sold 18 percent of their HRS wheat to firms in the "Other" catetory. Cargill and firms in the "Other" category had 15 and 13 percent market share, respectively, of the HRS wheat from elevators with a load-out capacity greater than 54 cars per day (Table 11). The "Other" category's large market share for the larger elevators could follow the same reasoning as in the previous paragraph.

## Premiums and Discounts

The 1990 HRS wheat crop had fair quality characteristics compared to previous years. One noticeable difference from 1988 and 1989 was the lower protein level in the HRS wheat crop (Table 12). Figure 2 shows the lower protein level in the 1990 HRS wheat crop compared to

1988 and 1989 and the lower protein level of the hard red winter (HRW) wheat crop from 1989. The protein premium increased over 1989 (Figure 3).

Figures 4 to 6 show the discounts for other selected grade factors over the years for both wheats. Figures 7 to 23 show how premiums and discounts varied. A spike in the charts indicates that a majority of the elevators had that premium or discount as the prevalent adjustment factor.

Average premiums and discounts since 1984 are given in Table 13. All discounts for durum in 1990 are less than discounts since 1987. The premium for 16 percent protein HRS increased substantially over the previous two years, and the discount for 12 percent protein HRS wheat increased over the 1989 level, probably because the average protein levels were lower in both the HRS and HRW wheat.

Price adjustment averages for durum and HRS wheat for individual CRD are presented in Table 14. CRD #4 tended to have lower discounts for durum. Premiums for 16 percent protein HRS wheat were lower for CRD #1, 4, and 7.

The premiums and discounts for durum and HRS wheat for both cooperatives and private elevators were similar to 1989, except for the 16 percent protein premium in HRS wheat. The private elevators offered a 41 cent premium compared to the 32 cent premium cooperative elevators offered (Table 15).

Premiums and discounts did not vary substantially based on load-out capacity, except for the 16 percent protein premium for HRS wheat. Elevators with a load-out capacity of 7 to 26 cars per day offered a higher premium for 16 percent protein (Table 16).

Elevators with competitors within 6 to 10 miles tended to have higher discounts for durum. Also, elevators (that handle durum) with competition within 5 miles tended to have lower discounts than elevators with competition more than 10 miles away. Elevators that handled HRS wheat and had competition 6 to 10 miles away tended to have higher discounts and the highest premium for 16 percent protein HRS wheat (Table 17).

Premiums for 16 percent protein HRS wheat were greater for elevators with storage capacity of 300,000 to 399,000 bushels and storage greater than one million bushels and were 40 cents and 38 cents, respectively. Elevators with storage capacity of 99,000 bushels or less had the smallest premium for 16 percent protein HRS wheat-27 cents (Table 18).

## Economics of Dockage Removal

About 70 percent of the wheat was cleaned before shipment in 1990. The average cleaning capacity was 2329 bushels of wheat per hour, ranging from 200 to 20,000 bushels per hour. At harvest, managers considered wheat with a dockage level of 1.92 percent or less as clean and did not clean this wheat. After harvest, wheat with dockage levels of 1.50 percent or less was considered clean. When

wheat was cleaned, it was cleaned to 0.82 percent and 0.70 percent dockage levels during harvest and post-harvest, respectively.

Two important variables affecting the economics of wheat cleaning are cost of cleaning and the price received for wheat screenings. The average cost of cleaning was 4.37 cents per bushel, and the average price received for screenings was $29.54 per ton in 1990, virtually unchanged from 1989 (Table 19).

The economics of cleaning wheat can be evaluated using the following equation:

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

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

Table 20, using different cleaning costs, prices received for wheat screenings, incoming dockage levels, and transportation costs, shows that the profitability (cleaning margin) depends on these factors and that profitability changes as these factors change.

## Summary and Conclusions

Premiums and discounts are dynamic with respect to location, time, and current and perceived market conditions. The 1990 HRS and durum wheat crops had fair quality characteristics compared to the previous years. Thus, discounts for HRS wheat characteristics generally have become less since 1988. All discounts for durum are less than discounts since 1987.

The 1990 HRS and HRW wheat protein levels fell from their 1988 and 1989 highs and the protein premium for HRS wheat increased over 1989. The premium for 16 percent protein HRS wheat was not uniform with respect to location and market participants. The protein premium was lower for the western CRDs of 1, 4, and 7. Also, private elevators offer higher protein premiums than cooperative elevators.

The market share of relatively small buyers who comprise the group of "Others" was significant. Elevators with a storage capacity greater than one million bushels and elevators with a train load-out capacity of 54 cars or more sold 15 and 13 percent, respectively, of their HRS wheat to firms comprising the group of "Others." The growth in the "Other" category might be the result of larger elevator's being able to market wheat outside of traditional outlets.

The economic incentives for dockage removal was virtually unchanged from 1989. The fact that 70 percent of the wheat was cleaned before shipment in 1990 indicates that cleaning is a profitable activity.

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# Appendix A

TABLE 1. NUMBER AND PERCENTAGE OF RESPONSES FROM NINE REGIONS ACROSS NORTH DAKOTA, 1990

| Region | Number of Elevators Receiving Questionnaires | Number of Elevators Responding | Percentage Responding |
|---|---|---|---|
| 1. Northwest | 56 | 8 | 14 |
| 2. North Central | 44 | 4 | 9 |
| 3. Northeast | 111 | 17 | 15 |
| 4. West Central | 20 | 2 | 10 |
| 5. Central | 48 | 11 | 23 |
| 6. East Central | 78 | 10 | 13 |
| 7. Southwest | 31 | 3 | 10 |
| 8. South Central | 28 | 5 | 18 |
| 9. Southeast | 73 | 15 | 20 |
| Total | 489 | 75 | 15 |

SOURCE: Question 2, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 2. ORGANIZATIONAL STRUCTURE OF RESPONDING ELEVATORS, 1990

| Types | Number | Percentage |
|---|---|---|
| Cooperatives | 53 | 71 |
| Private | 22 | 29 |
| Total | 75 | 100 |

SOURCE: Question 3, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 3. LOAD-OUT CAPACITY OF RESPONDING ELEVATORS, 1990

| Load-Out Capacity | Number | Percentage |
|---|---|---|
| 6 or less cars/day | 12 | 16 |
| 7 to 26 cars/day | 36 | 48 |
| 27 to 54 cars/day | 20 | 27 |
| More than 54 cars/day | 7 | 9 |
| Total | 75 | 100 |

SOURCE: Question 4, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 4. DISTANCE TO NEAREST COMPETITION OF RESPONDING ELEVATORS, 1990

| Distance to Competition | Number | Percentage |
|---|---|---|
| Less than 5 miles | 22 | 29 |
| 6 to 10 miles | 32 | 43 |
| More than 10 miles | 21 | 28 |
| Total | 75 | 100 |

SOURCE: Question 5, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 5. STORAGE CAPACITY OF RESPONDING ELEVATORS, 1990

| Storage Capacity | Number | Percentage |
|---|---|---|
| Less than 100,000 bushels | 4 | 5 |
| 100,000 to 199,000 bushels | 5 | 7 |
| 200,000 to 299,000 bushels | 4 | 5 |
| 300,000 to 399,000 bushels | 13 | 17 |
| 400,000 to 999,000 bushels | 33 | 44 |
| Over 1,000,000 bushels | 16 | 21 |
| Total | 75 | 100 |

SOURCE: Question 6, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

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, DECEMBER 5, 1990

| Region | Average Durum Price | Average HRS Wheat Price |
|---|---|---|
| 1. Northwest | 242 | 225 |
| 2. North Central | 237 | 217 |
| 3. Northeast | 247 | 224 |
| 4. West Central | 235 | 222 |
| 5. Central | 249 | 218 |
| 6. East Central | 229 | 242 |
| 7. Southwest | 234 | 226 |
| 8. South Central | 239 | 220 |
| 9. Southeast | 242 | 224 |
| State Average | 239 | 224 |

SOURCE: Question 15 and 17, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 7. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT, 1990

| Company | Durum | HRS Wheat |
|---|---|---|
| | ------percent------- | |
| Harvest States | 35 | 34 |
| Atwood-Larson | 14 | 13 |
| Benson-Quinn | 20 | 19 |
| Kellogg | 7 | 7 |
| Cargill | 3 | 5 |
| Peavey | 10 | 10 |
| Continental | 2 | 2 |
| International Multifoods | 0 | 1 |
| North Dakota State Mill | 3 | 1 |
| Others | 6 | 8 |

SOURCE: Question 7, Grain Marketing Questionnaire, Fall 1990, 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 8. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY REGION FROM RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT, 1990

| Commodity (Base Grade) | Company | Region 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | percent | | | | | | | | |
| Durum | Harvest States | 33 | 32 | 41 | 40 | 36 | 19 | 58 | 0 | 38 |
| | Atwood-Larson | 3 | 33 | 12 | 45 | 0 | 20 | 2 | 57 | 16 |
| | Benson-Quinn | 15 | 30 | 26 | 0 | 19 | 33 | 0 | 0 | 20 |
| | Kellogg | 14 | 0 | 1 | 0 | 17 | 0 | 0 | 33 | 2 |
| | Cargill | 13 | 3 | 1 | 5 | 0 | 7 | 0 | 0 | 2 |
| | Peavey | 3 | 0 | 7 | 0 | 26 | 0 | 33 | 0 | 9 |
| | Continental | 6 | 0 | 1 | 0 | 0 | 8 | 3 | 0 | 0 |
| | IMF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ND State Mill | 3 | 0 | 12 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Other | 11 | 2 | 1 | 8 | 1 | 13 | 3 | 10 | 12 |
| HRS | Harvest States | 41 | 50 | 41 | 43 | 26 | 14 | 26 | 20 | 42 |
| | Atwood-Larson | 3 | 10 | 13 | 48 | 4 | 1 | 8 | 40 | 23 |
| | Benson-Quinn | 9 | 10 | 27 | 0 | 16 | 43 | 0 | 0 | 17 |
| | Kellogg | 13 | 0 | 6 | 0 | 12 | 10 | 0 | 22 | 1 |
| | Cargill | 14 | 0 | 0 | 0 | 4 | 19 | 2 | 0 | 1 |
| | Peavey | 2 | 5 | 6 | 0 | 32 | 3 | 0 | 6 | 12 |
| | Continental | 5 | 0 | 5 | 0 | 0 | 6 | 3 | 0 | 0 |
| | IMF | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| | Others | 14 | 25 | 2 | 10 | 6 | 0 | 62 | 12 | 4 |

SOURCE: Question 2 and 7, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 9. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY ORGANIZATION FROM RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT, 1990

| Commodity (Base Grade) | Company | Investor-Owned Firm | Cooperative |
|---|---|---|---|
| | | --------percent------- | |
| Durum | Harvest States | 3 | 48 |
| | Atwood-Larson | 25 | 9 |
| | Benson-Quinn | 15 | 22 |
| | Kellogg | 10 | 5 |
| | Cargill | 6 | 2 |
| | Peavey | 29 | 2 |
| | Continental | 2 | 2 |
| | IMF | 0 | 0 |
| | ND State Mill | 2 | 4 |
| | Others | 8 | 6 |
| | | 100 | 100 |
| HRS | Harvest States | 4 | 46 |
| | Atwood-Larson | 18 | 11 |
| | Benson-Quinn | 18 | 20 |
| | Kellogg | 19 | 3 |
| | Cargill | 8 | 4 |
| | Peavey | 21 | 5 |
| | Continental | 1 | 3 |
| | IMF | 2 | 0 |
| | Others | 9 | 8 |
| | | 100 | 100 |

SOURCE: Question 3 and 7, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 10. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY SIZE OF ELEVATORS FOR DURUM AND HRS WHEAT, 1990

| 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 | 33 | 37 | 3 | 36 | 33 | 44 |
| | Atwood-Larson | 0 | 12 | 25 | 19 | 14 | 10 |
| | Benson-Quinn | 0 | 14 | 0 | 31 | 28 | 11 |
| | Kellogg | 33 | 0 | 48 | 4 | 1 | 7 |
| | Cargill | 0 | 0 | 0 | 2 | 1 | 10 |
| | Peavey | 33 | 29 | 25 | 0 | 6 | 6 |
| | Continental | 0 | 1 | 0 | 0 | 1 | 5 |
| | IMF | 0 | 0 | 0 | 0 | 0 | 0 |
| | ND State Mill | 0 | 2 | 0 | 0 | 7 | 2 |
| | Other | 0 | 4 | 0 | 8 | 9 | 5 |
| HRS | Harvest States | 25 | 60 | 15 | 35 | 31 | 36 |
| | Atwood-Larson | 15 | 1 | 15 | 12 | 17 | 8 |
| | Benson-Quinn | 0 | 20 | 0 | 21 | 29 | 6 |
| | Kellogg | 25 | 0 | 34 | 9 | 3 | 6 |
| | Cargill | 0 | 0 | 0 | 3 | 3 | 15 |
| | Peavey | 1 | 19 | 33 | 8 | 7 | 11 |
| | Continental | 0 | 0 | 0 | 0 | 5 | 2 |
| | IMF | 0 | 0 | 0 | 3 | 0 | 1 |
| | Others | 35 | 0 | 4 | 9 | 4 | 15 |

SOURCE: Question 6 and 7, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 11. MARKET SHARE COMMISSION COMPANIES AND TRACK BUYER BY LOAD-OUT CAPACITY FROM RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT, 1990

| 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 | 29 | 32 | 34 | 57 |
| | Atwood-Larson | 25 | 11 | 11 | 14 |
| | Benson-Quinn | 8 | 28 | 16 | 13 |
| | Kellogg | 11 | 7 | 6 | 1 |
| | Cargill | 0 | 1 | 8 | 7 |
| | Peavey | 19 | 10 | 7 | 0 |
| | Continental | 1 | 2 | 2 | 1 |
| | IMF | 0 | 0 | 0 | 0 |
| | ND State Mill | 0 | 2 | 9 | 1 |
| | Other | 7 | 6 | 7 | 7 |
| HRS | Harvest States | 29 | 31 | 36 | 49 |
| | Atwood-Larson | 15 | 10 | 20 | 8 |
| | Benson-Quinn | 8 | 23 | 21 | 10 |
| | Kellogg | 19 | 7 | 5 | 0 |
| | Cargill | 1 | 3 | 8 | 15 |
| | Peavey | 9 | 12 | 8 | 2 |
| | Continental | 0 | 4 | 2 | 2 |
| | IMF | 1 | 1 | 0 | 0 |
| | Others | 18 | 9 | 1 | 13 |

*Totals may not add to 100 due to rounding.

SOURCE: Question 5 and 7, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 12. QUALITY OF 1986, 1987, 1988, 1989, AND 1990 DURUM AND HRS WHEAT CROPS

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

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

TABLE 13. AVERAGE PRICE ADJUSTMENTS FOR EACH FACTOR AMONG RESPONDING NORTH DAKOTA COUNTRY ELEVATORS (FALL OF 1984, 1985, 1986, 1987, 1988, 1989, AND 1990)

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

SOURCE: Questions 16 and 18, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 14. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS OF SPECIFIED REGIONS IN NORTH DAKOTA (FALL 1990)

| Commodity (Base Grade) | Company | Region 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ¢/bu | | | | | | | | |
| Durum | 58 lbs test weight | -5 | -5 | -5 | -6 | -5 | -3 | -5 | -4 | -4 |
| #1 HAD | 14.5% moisture | -6 | -4 | -6 | -6 | -6 | -4 | -4 | -3 | -5 |
| | Amber durum | -8 | -12 | -12 | -5 | -10 | -9 | -15 | -14 | -9 |
| | 4% damaged kernels | -8 | -7 | -8 | -3 | -8 | -8 | -10 | -8 | -10 |
| | 1% foreign material | -2 | -2 | -2 | -1 | -3 | -2 | -1 | -2 | -2 |
| | 5% shrunken & broken kernels | -2 | -4 | -4 | -2 | -4 | -3 | -2 | -7 | -5 |
| | 2% contrasting classes | -6 | -6 | -4 | -3 | -4 | -4 | -7 | -6 | -6 |
| | 5% wheat of other classes | -9 | -9 | -7 | -8 | -9 | -6 | -11 | -9 | -15 |
| HRS | 57 lbs test weight | -2 | -3 | -3 | -2 | -2 | -2 | -2 | -2 | -2 |
| #1 DNS | 14.5% moisture | -5 | -4 | -6 | -3 | -5 | -5 | -4 | -3 | -5 |
| 14% Protein | 16% protein | 12 | 24 | 37 | 17 | 42 | 45 | 22 | 36 | 40 |
| | 12% protein | -11 | -8 | -10 | -8 | -9 | -10 | -10 | -14 | -10 |
| | 4% damaged kernels | -8 | -8 | -8 | -7 | -15 | -7 | -12 | -9 | -10 |
| | 1% foreign material | -2 | -1 | -2 | -1 | -2 | -2 | -1 | -3 | -1 |
| | 5% shrunken & broken kernels | -1 | -4 | -3 | -1 | -4 | -3 | -2 | -4 | -4 |
| | 2% contrasting classes | -6 | -5 | -3 | -2 | -3 | -1 | -2 | -2 | -2 |
| | 5% wheat of other classes | -8 | -12 | -6 | -4 | -6 | -4 | -6 | -6 | -7 |

SOURCE: Questions 2, 16, and 18, Grain Marketing, Questionnaire Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 15. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG SELECTED TYPES OF ELEVATOR STRUCTURE ORGANIZATIONS (FALL, 1990)

| Commodity (Base Grade) | Factor | Cooperative | Private |
|---|---|---|---|
| | | ¢/bu. | |
| Durum #1 HAD | 58 lbs. test weight | - 5 | -4 |
| | 14.5% moisture | - 5 | -5 |
| | Amber durum | -9 | -13 |
| | 4% damaged kernels | -8 | -9 |
| | 1% foreign material | -2 | -2 |
| | 5% shrunken and broken kernels | -3 | -6 |
| | 2% contrasting classes | -5 | -4 |
| | 5% wheat of other classes | -10 | -9 |
| HRS #1 DNS 14% Protein | 57 lbs. test weight | -2 | -2 |
| | 14.5% moisture | -5 | -4 |
| | 16% protein | 32 | 41 |
| | 12% protein | -10 | -11 |
| | 4% damaged kernels | -10 | -8 |
| | 1% foreign material | -2 | -1 |
| | 5% shrunken and broken kernels | -3 | -4 |
| | 2% contrasting classes | -3 | -2 |
| | 5% wheat of other classes | -7 | -5 |

SOURCE: Questions 2, 16, and 18, Grain Marketing, Questionnaire Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 16. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED LOAD-OUT CAPACITIES (FALL, 1990)

| 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 | -4 | -4 | -5 | -6 |
| | 14.5% moisture | -4 | -5 | -7 | -5 |
| | Amber durum | -11 | -10 | -10 | -10 |
| | 4% damaged kernels | -9 | -8 | -8 | -9 |
| | 1% foreign material | -2 | -2 | 2 | -1 |
| | 5% shrunken and broken kernels | -5 | -4 | -3 | -3 |
| | 2% contrasting classes | -5 | -5 | -4 | -4 |
| | 5% wheat of other classes | -10 | -9 | -10 | -11 |
| HRS #1 DNS 14% Protein | 57 lbs. test weight | -2 | -2 | -2 | -2 |
| | 14.5% moisture | -4 | -5 | -7 | -4 |
| | 16% protein | 31 | 38 | 33 | 34 |
| | 12% protein | -10 | -10 | -10 | -11 |
| | 4% damaged kernels | -8 | -10 | -9 | -11 |
| | 1% foreign material | -2 | -1 | -2 | -1 |
| | 5% shrunken and broken kernels | -2 | -4 | -3 | -2 |
| | 2% contrasting classes | -2 | -4 | -2 | -2 |
| | 5% wheat of other classes | -6 | -7 | -6 | -6 |

SOURCE: Questions 4, 16, and 18, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 17. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED DISTANCES TO NEAREST COMPETITION (FALL, 1990)

| Commodity (Base Grade) | Factor | Less Than 5 Miles | 6 To 10 Miles | Greater Than 10 Miles |
|---|---|---|---|---|
| | | ¢/bu. | | |
| Durum #1 HAD | 58 lbs. test weight | -3 | -5 | -5 |
| | 14.5% moisture | -5 | -6 | -4 |
| | Amber durum | -9 | -10 | -10 |
| | 4% damaged kernels | -7 | -9 | -8 |
| | 1% foreign material | -1 | -2 | -2 |
| | 5% shrunken and broken kernels | -3 | -5 | -3 |
| | 2% contrasting classes | -5 | -5 | -5 |
| | 5% wheat of other classes | -8 | -11 | -9 |
| HRS #1 DNS 14% Protein | 57 lbs. test weight | -2 | -2 | -2 |
| | 14.5% moisture | -4 | -6 | -4 |
| | 16% protein | 34 | 37 | 31 |
| | 12% protein | -10 | -10 | -10 |
| | 4% damaged kernels | -7 | -12 | -8 |
| | 1% foreign material | -1 | -2 | -2 |
| | 5% shrunken and broken kernels | -2 | -4 | -3 |
| | 2% contrasting classes | -3 | -3 | -3 |
| | 5% wheat of other classes | -6 | -7 | -6 |

SOURCE: Questions 5, 16, and 18, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 18. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED STORAGE CAPACITIES (FALL, 1990)

| 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 | 58 lbs test weight | -4 | -4 | -4 | -6 | -4 | -5 |
| #1 HAD | 14.5% moisture | -5 | -5 | -5 | -6 | -5 | -6 |
| | 4% damaged kernels | -12 | -9 | -10 | -12 | -10 | -9 |
| | 4% damaged kernels | -7 | -7 | -9 | -9 | -8 | -9 |
| | 1% foreign material | -2 | -1 | -1 | -3 | -2 | -2 |
| | 5% shrunken & broken kernels | -4 | -6 | -6 | -4 | -3 | -4 |
| | 2% contrasting classes | -5 | -5 | -4 | -7 | -5 | -3 |
| | 5% wheat of other classes | -6 | -6 | -12 | -12 | -9 | -9 |
| HRS | 57 lbs test weight | -2 | -2 | -3 | -2 | -2 | -2 |
| #1 DNS | 14.5% moisture | -4 | -6 | -5 | -5 | -5 | -5 |
| 14% Protein | 16% protein | 27 | 33 | 33 | 40 | 32 | 38 |
| | 12% protein | -9 | -9 | -10 | -10 | -10 | -11 |
| | 4% damaged kernels | -8 | -9 | -10 | -7 | -11 | -9 |
| | 1% foreign material | -2 | -1 | -1 | -1 | -2 | -2 |
| | 5% shrunken & broken kernels | -4 | -3 | -4 | -3 | -2 | -4 |
| | 2% contrasting classes | -2 | -4 | -4 | -3 | -2 | -2 |
| | 5% wheat of other classes | -7 | -7 | -9 | -6 | -5 | -7 |

SOURCE: Questions 6, 16, and 18, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 19. AVERAGE, HIGH, AND LOW CLEANING COSTS AND WHEAT SCREENING PRICES FOR 1986, 1987, 1988, 1989, AND 1990

| Item | 1986 | | | 1987 | | | 1988 | | | 1989 | | | 1990 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Avg | High | Low | Avg | High | Low | Avg | High | Low | Avg | High | Low | Avg | High | Low |
| | ¢/bu | | | | | | | | | | | | | | |
| Cleaning costs | 4.00 | 25.00 | 0.0 | 3.50 | 20.00 | 0.0 | 4.00 | 20.00 | 0.00 | 4.64 | 30.00 | 0.00 | 4.37 | 25.00 | 0.00 |
| | $/ton | | | | | | | | | | | | | | |
| Prices received | 16.08 | 45.00 | 0.0 | 9.90 | 30.00 | 0.0 | 26.94 | 45.00 | 10.00 | 30.27 | 50.00 | 5.00 | 29.54 | 50.00 | 15.00 |

SOURCE: Questions 12 and 14, Grain Marketing Questionnaire, Fall 1990, Fargo, NDSU, Department of Agricultural Economics.

TABLE 20. ECONOMICS OF CLEANING WHEAT WITH VARIOUS SPECIFIED CLEANING COSTS, SCREENING PRICES, AND INCOMING DOCKAGE LEVELS AT A TRANSPORTATION COST OF $.60/BU

| Incoming Dockage Levels | Net Profit on 50,000 lb. Price Received with Cleaning Cost of 4¢/Bu. | | | Price Received with Cleaning Cost of 5¢/Bu. | | |
|---|---|---|---|---|---|---|
| | screening value per lb | | | | | |
| | .02 | .015 | .01 | .02 | .015 | .01 |
| 5 | 41.67 | 29.17 | 16.67 | 33.33 | 20.83 | 8.83 |
| 4 | 26.67 | 16.67 | 6.67 | 18.33 | 8.33 | (1.67) |
| 3 | 11.67 | 4.17 | (3.33) | 3.33 | (4.67) | (11.67) |
| 2 | (3.33) | (8.33) | (13.33) | (11.67) | (16.67) | (21.67) |
| 1 | (18.33) | (20.83) | (23.33) | (26.67) | (29.17) | (31.67) |

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

where

W = amount of wheat in lbs.

D = % of dockage in the wheat

S = price received for wheat screening per lb.

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

C = cost of cleaning wheat per lb.

# Appendix B

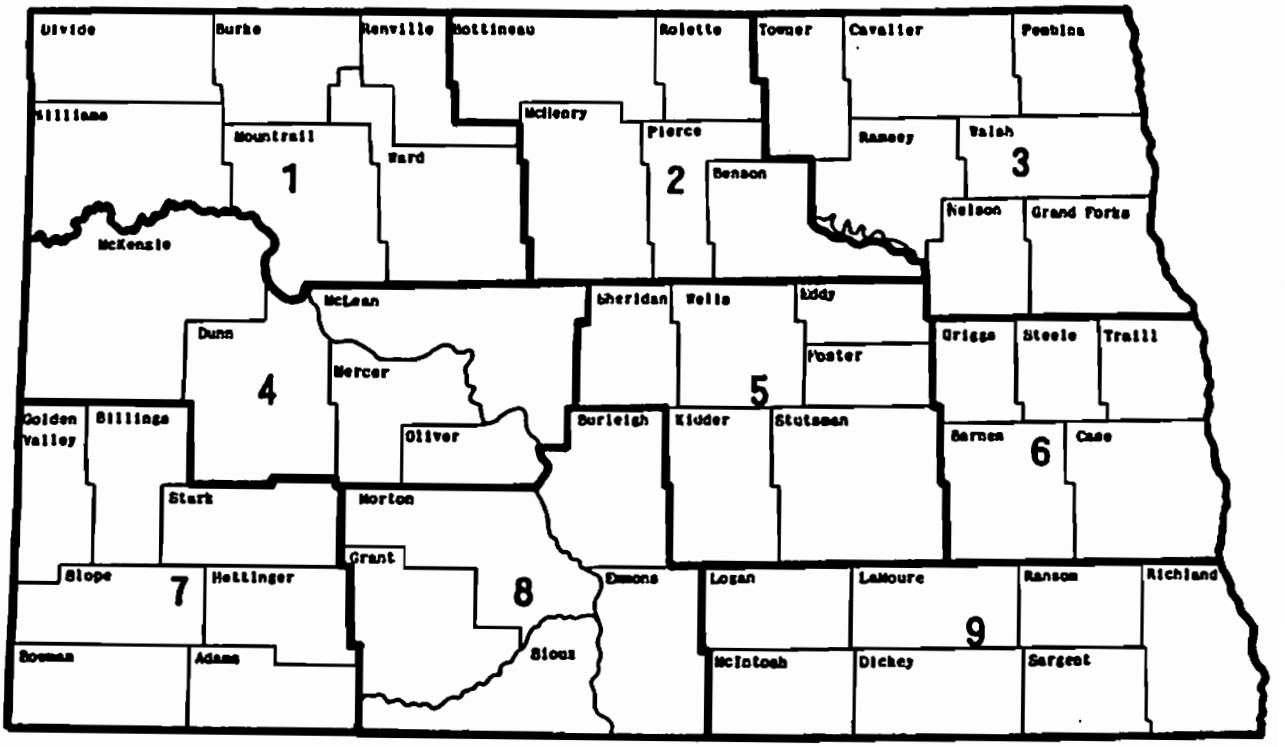



Figure 1. Nine Regions Used to Divide Responding Elevators by Location in the State

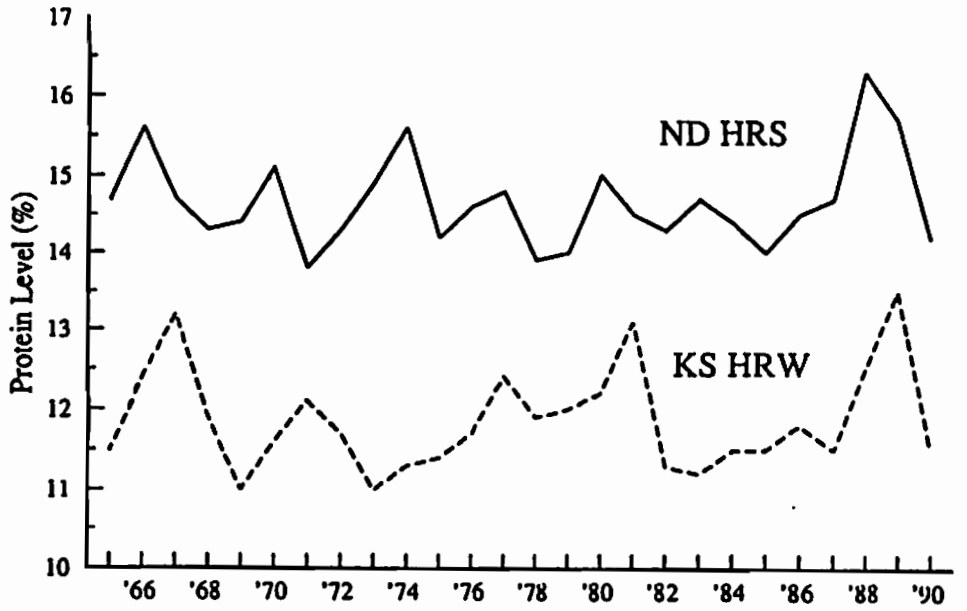



Figure 2. HRS and HRW Average Protein Level, on a 12% Moisture Basis, North Dakota and Kansas

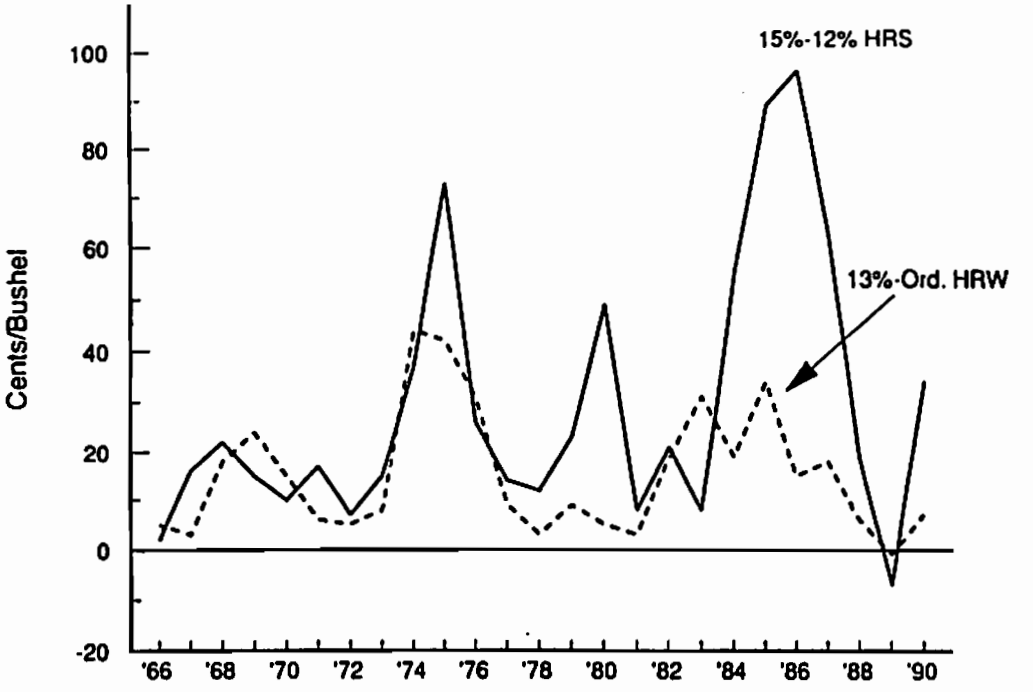



Figure 3. HRS and HRW Market Protein Premium

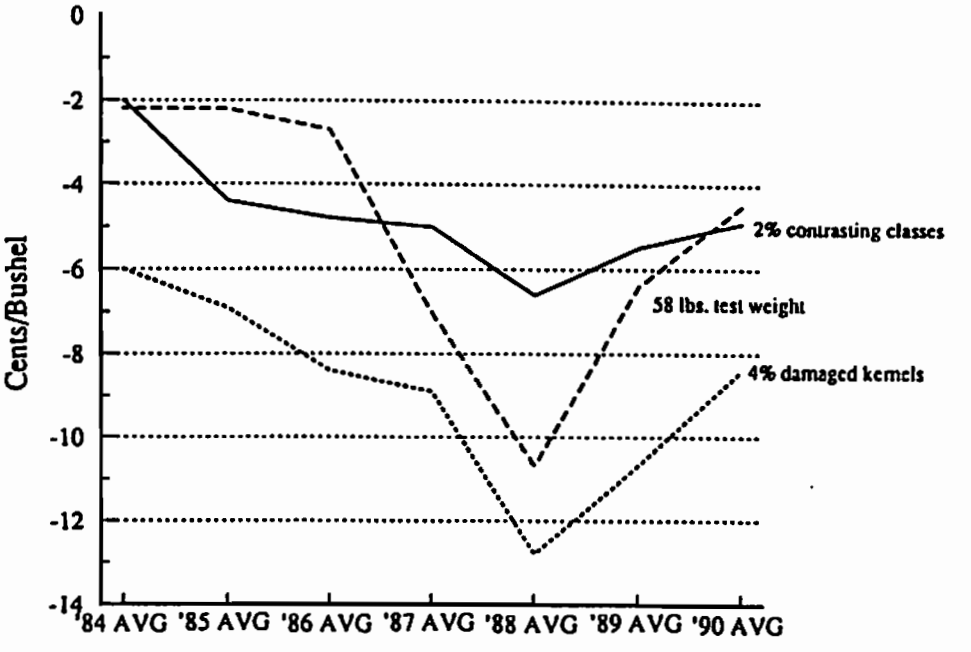



Figure 4. Average Price Adjustments Among North Dakota Country Elevators, Durum (#1 HAD)

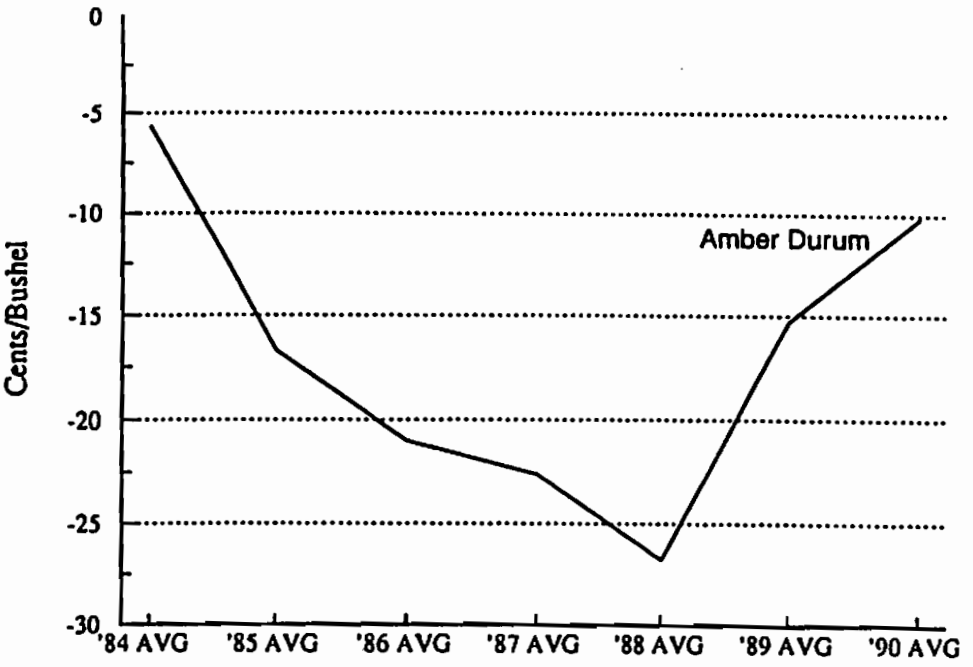



Figure 5. Average Price Adjustment Among North Dakota Country Elevators, Durum (#1 HAD)

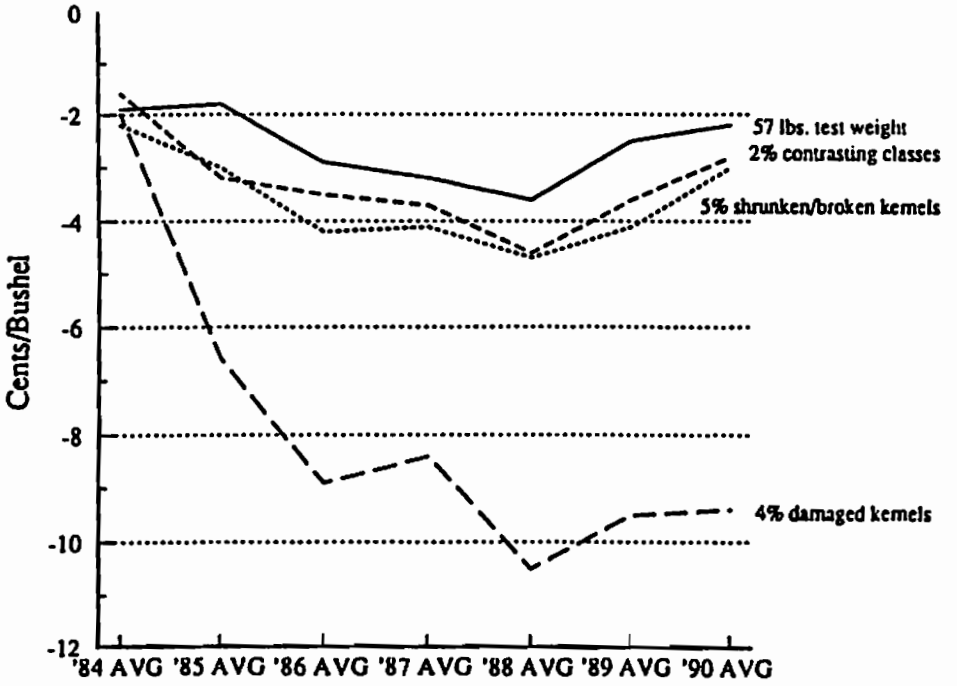
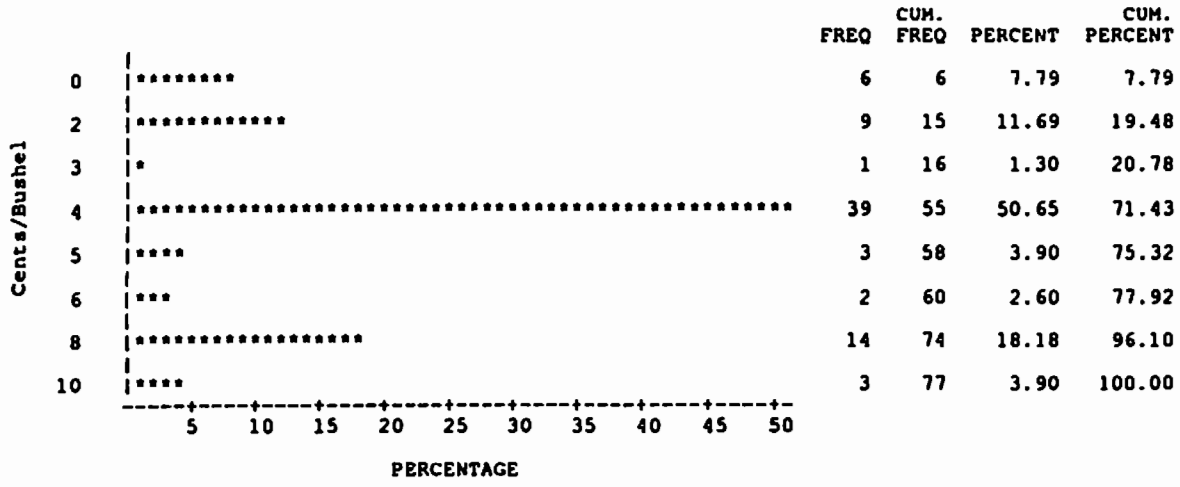
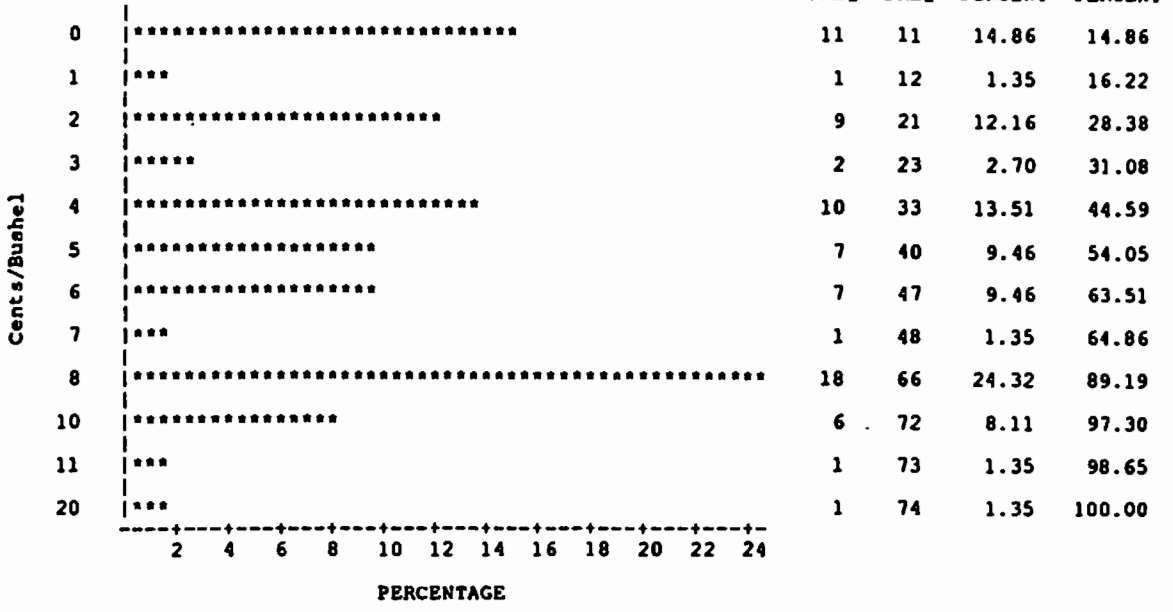



Figure 6. Average Price Adjustments Among North Dakota Country Elevators, HRS (#1 DNS) 14% Protein



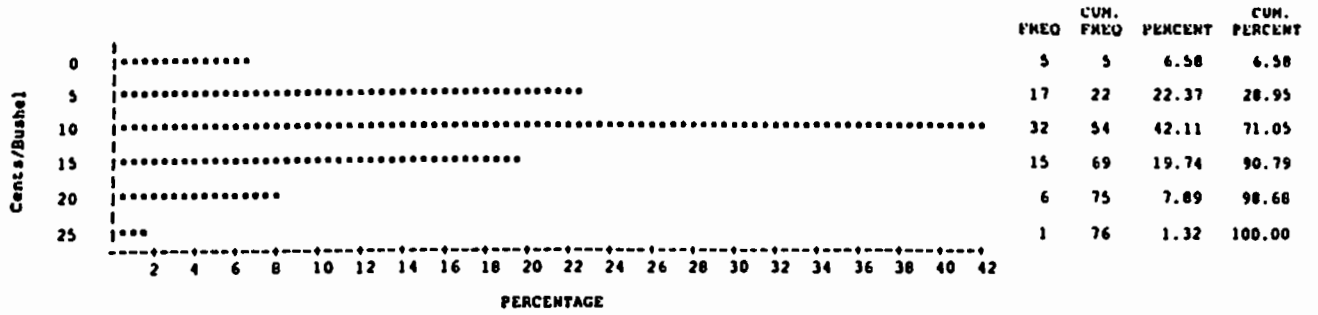

| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 6 | 6 | 7.79 | 7.79 |
| 2 | 9 | 15 | 11.69 | 19.48 |
| 3 | 1 | 16 | 1.30 | 20.78 |
| 4 | 39 | 55 | 50.65 | 71.43 |
| 5 | 3 | 58 | 3.90 | 75.32 |
| 6 | 2 | 60 | 2.60 | 77.92 |
| 8 | 14 | 74 | 18.18 | 96.10 |
| 10 | 3 | 77 | 3.90 | 100.00 |

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



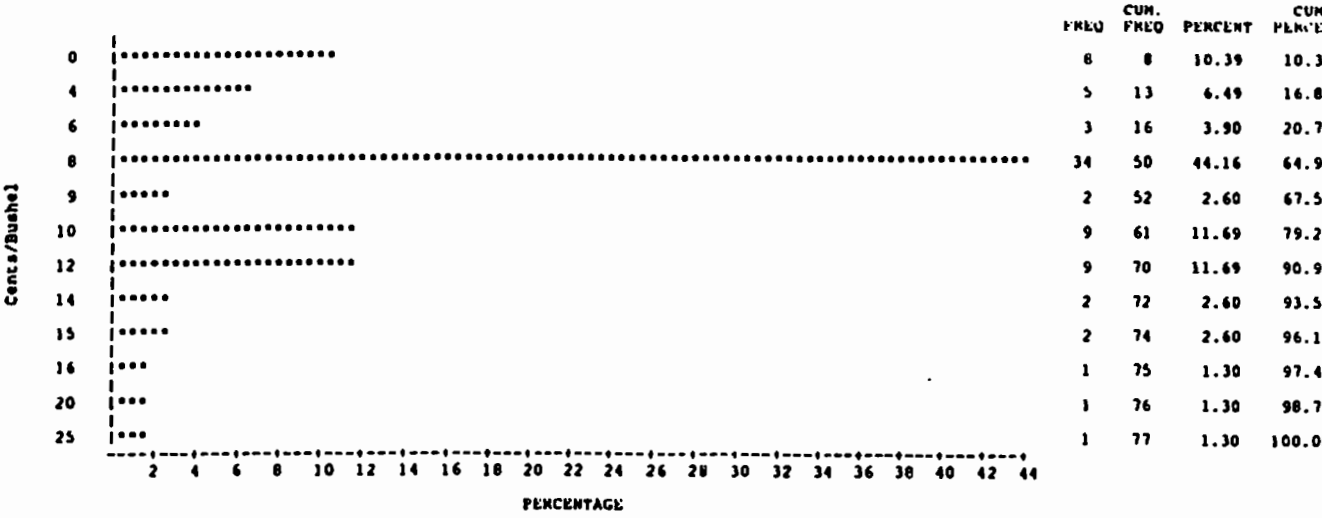

| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 11 | 11 | 14.86 | 14.86 |
| 1 | 1 | 12 | 1.35 | 16.22 |
| 2 | 9 | 21 | 12.16 | 28.38 |
| 3 | 2 | 23 | 2.70 | 31.08 |
| 4 | 10 | 33 | 13.51 | 44.59 |
| 5 | 7 | 40 | 9.46 | 54.05 |
| 6 | 7 | 47 | 9.46 | 63.51 |
| 7 | 1 | 48 | 1.35 | 64.86 |
| 8 | 18 | 66 | 24.32 | 89.19 |
| 10 | 6 | 72 | 8.11 | 97.30 |
| 11 | 1 | 73 | 1.35 | 98.65 |
| 20 | 1 | 74 | 1.35 | 100.00 |

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



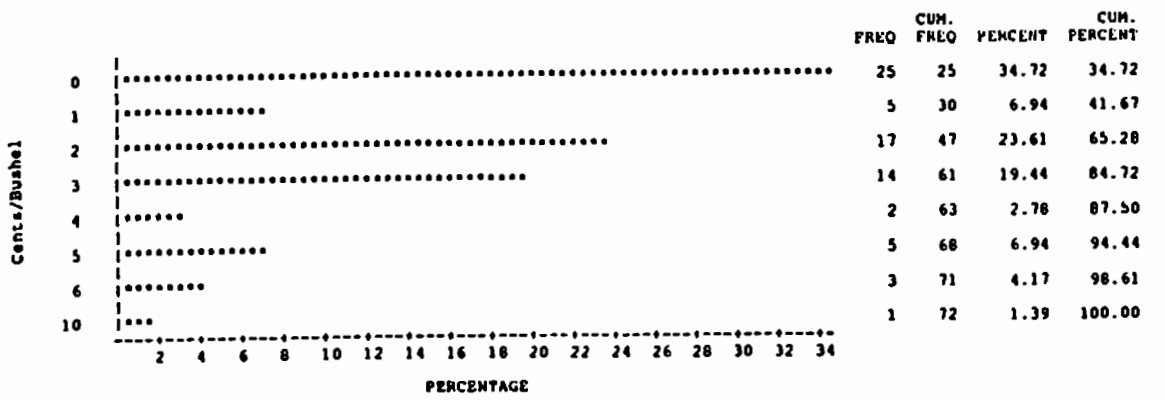

| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 5 | 5 | 6.58 | 6.58 |
| 5 | 17 | 22 | 22.37 | 28.95 |
| 10 | 32 | 54 | 42.11 | 71.05 |
| 15 | 15 | 69 | 19.74 | 90.79 |
| 20 | 6 | 75 | 7.89 | 98.68 |
| 25 | 1 | 76 | 1.32 | 100.00 |

Figure 9. Frequency of Discounts for Amber Durum Wheat



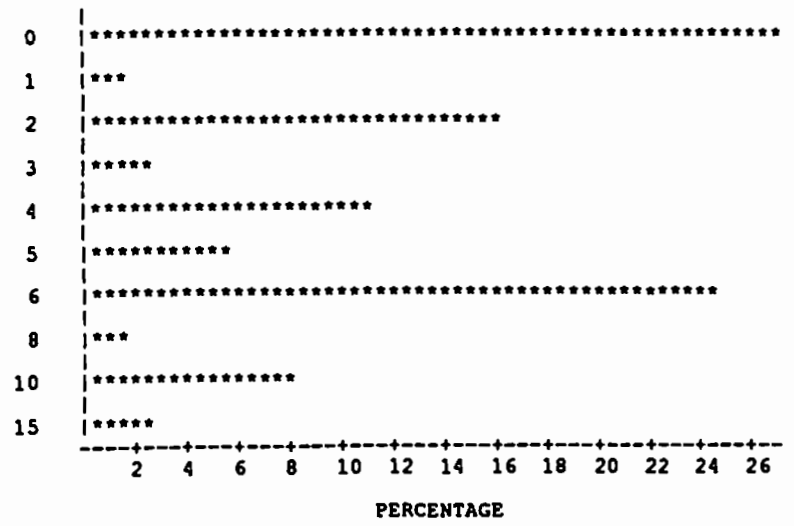

| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 8 | 8 | 10.39 | 10.39 |
| 4 | 5 | 13 | 6.49 | 16.88 |
| 6 | 3 | 16 | 3.90 | 20.78 |
| 8 | 34 | 50 | 44.16 | 64.94 |
| 9 | 2 | 52 | 2.60 | 67.53 |
| 10 | 9 | 61 | 11.69 | 79.22 |
| 12 | 9 | 70 | 11.69 | 90.91 |
| 14 | 2 | 72 | 2.60 | 93.51 |
| 15 | 2 | 74 | 2.60 | 96.10 |
| 16 | 1 | 75 | 1.30 | 97.40 |
| 20 | 1 | 76 | 1.30 | 98.70 |
| 25 | 1 | 77 | 1.30 | 100.00 |

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



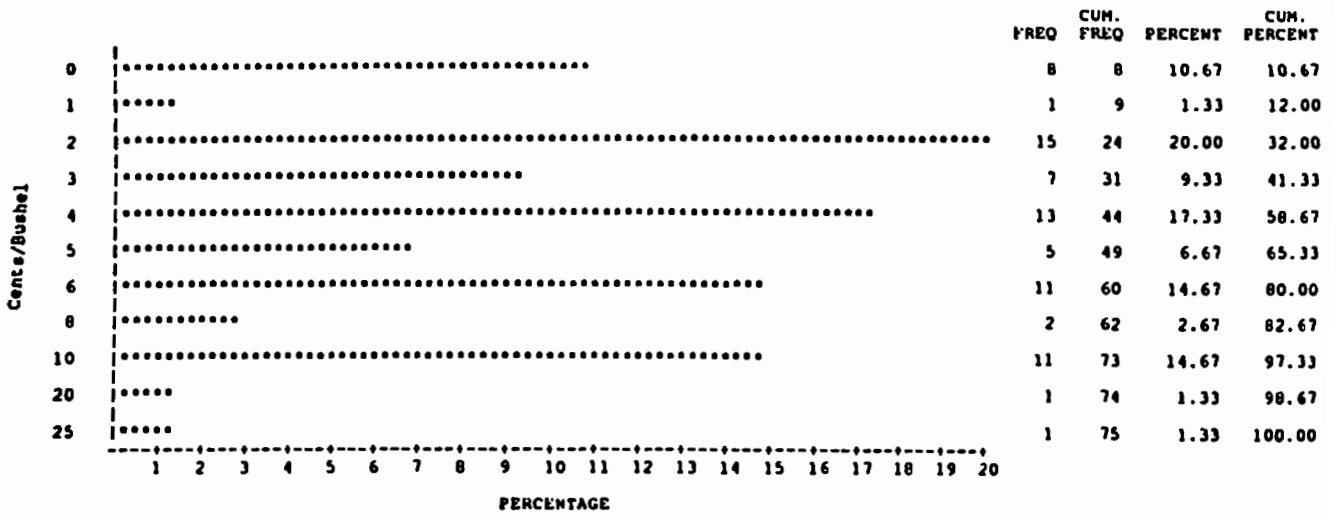

| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 25 | 25 | 34.72 | 34.72 |
| 1 | 5 | 30 | 6.94 | 41.67 |
| 2 | 17 | 47 | 23.61 | 65.28 |
| 3 | 14 | 61 | 19.44 | 84.72 |
| 4 | 2 | 63 | 2.78 | 87.50 |
| 5 | 5 | 68 | 6.94 | 94.44 |
| 6 | 3 | 71 | 4.17 | 98.61 |
| 10 | 1 | 72 | 1.39 | 100.00 |

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



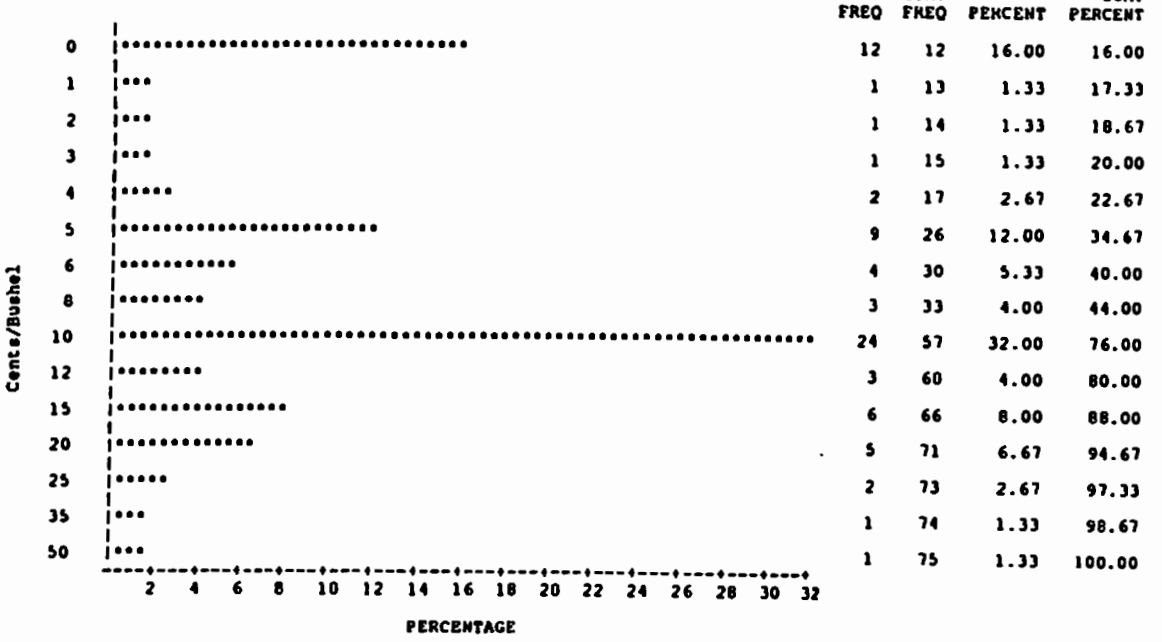

| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 20 | 20 | 27.03 | 27.03 |
| 1 | 1 | 21 | 1.35 | 28.38 |
| 2 | 12 | 33 | 16.22 | 44.59 |
| 3 | 2 | 35 | 2.70 | 47.30 |
| 4 | 8 | 43 | 10.81 | 58.11 |
| 5 | 4 | 47 | 5.41 | 63.51 |
| 6 | 18 | 65 | 24.32 | 87.84 |
| 8 | 1 | 66 | 1.35 | 89.19 |
| 10 | 6 | 72 | 8.11 | 97.30 |
| 15 | 2 | 74 | 2.70 | 100.00 |

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



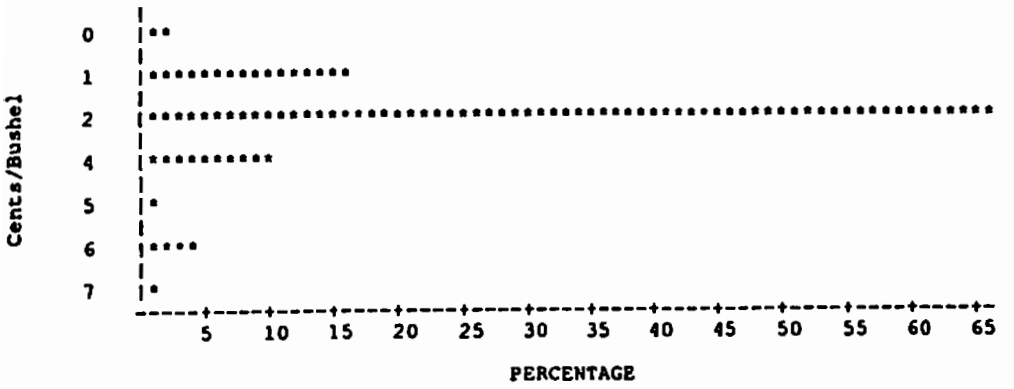

| Cents/Bushel | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 8 | 8 | 10.67 | 10.67 |
| 1 | 1 | 9 | 1.33 | 12.00 |
| 2 | 15 | 24 | 20.00 | 32.00 |
| 3 | 7 | 31 | 9.33 | 41.33 |
| 4 | 13 | 44 | 17.33 | 58.67 |
| 5 | 5 | 49 | 6.67 | 65.33 |
| 6 | 11 | 60 | 14.67 | 80.00 |
| 8 | 2 | 62 | 2.67 | 82.67 |
| 10 | 11 | 73 | 14.67 | 97.33 |
| 20 | 1 | 74 | 1.33 | 98.67 |
| 25 | 1 | 75 | 1.33 | 100.00 |

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



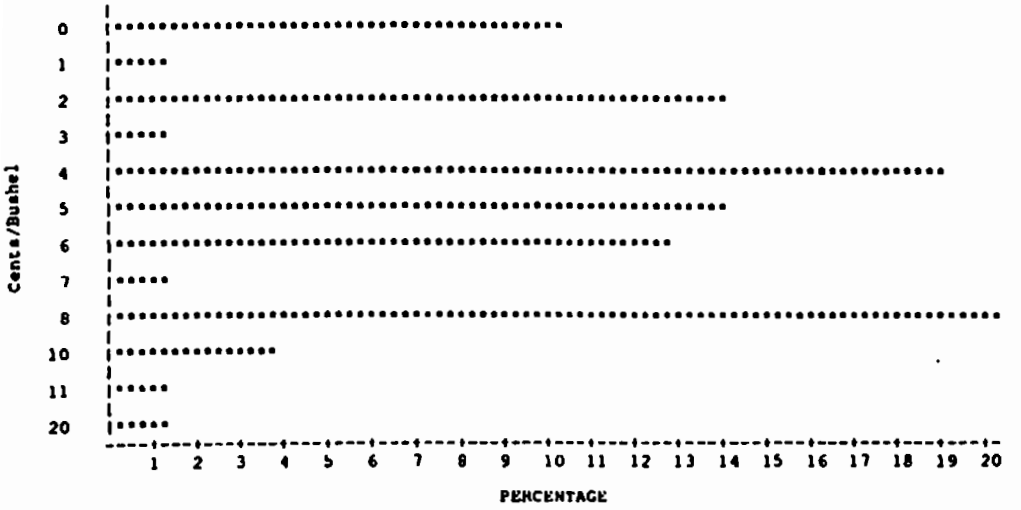

| Cents/Bushel | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 12 | 12 | 16.00 | 16.00 |
| 1 | 1 | 13 | 1.33 | 17.33 |
| 2 | 1 | 14 | 1.33 | 18.67 |
| 3 | 1 | 15 | 1.33 | 20.00 |
| 4 | 2 | 17 | 2.67 | 22.67 |
| 5 | 9 | 26 | 12.00 | 34.67 |
| 6 | 4 | 30 | 5.33 | 40.00 |
| 8 | 3 | 33 | 4.00 | 44.00 |
| 10 | 24 | 57 | 32.00 | 76.00 |
| 12 | 3 | 60 | 4.00 | 80.00 |
| 15 | 6 | 66 | 8.00 | 88.00 |
| 20 | 5 | 71 | 6.67 | 94.67 |
| 25 | 2 | 73 | 2.67 | 97.33 |
| 35 | 1 | 74 | 1.33 | 98.67 |
| 50 | 1 | 75 | 1.33 | 100.00 |

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




| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 2 | 2 | 2.41 | 2.41 |
| 1 | 13 | 15 | 15.66 | 18.07 |
| 2 | 55 | 70 | 66.27 | 84.34 |
| 4 | 8 | 78 | 9.64 | 93.98 |
| 5 | 1 | 79 | 1.20 | 95.18 |
| 6 | 3 | 82 | 3.61 | 98.80 |
| 7 | 1 | 83 | 1.20 | 100.00 |

Figure 15. Frequency of Discounts for 57-lb. Test Weight in HRS Wheat Among Selected Country Elevators in North Dakota




| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 8 | 8 | 10.13 | 10.13 |
| 1 | 1 | 9 | 1.27 | 11.39 |
| 2 | 11 | 20 | 13.92 | 25.32 |
| 3 | 1 | 21 | 1.27 | 26.58 |
| 4 | 15 | 36 | 18.99 | 45.57 |
| 5 | 11 | 47 | 13.92 | 59.49 |
| 6 | 10 | 57 | 12.66 | 72.15 |
| 7 | 1 | 58 | 1.27 | 73.42 |
| 8 | 16 | 74 | 20.25 | 93.67 |
| 10 | 3 | 77 | 3.80 | 97.47 |
| 11 | 1 | 78 | 1.27 | 98.73 |
| 20 | 1 | 79 | 1.27 | 100.00 |

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

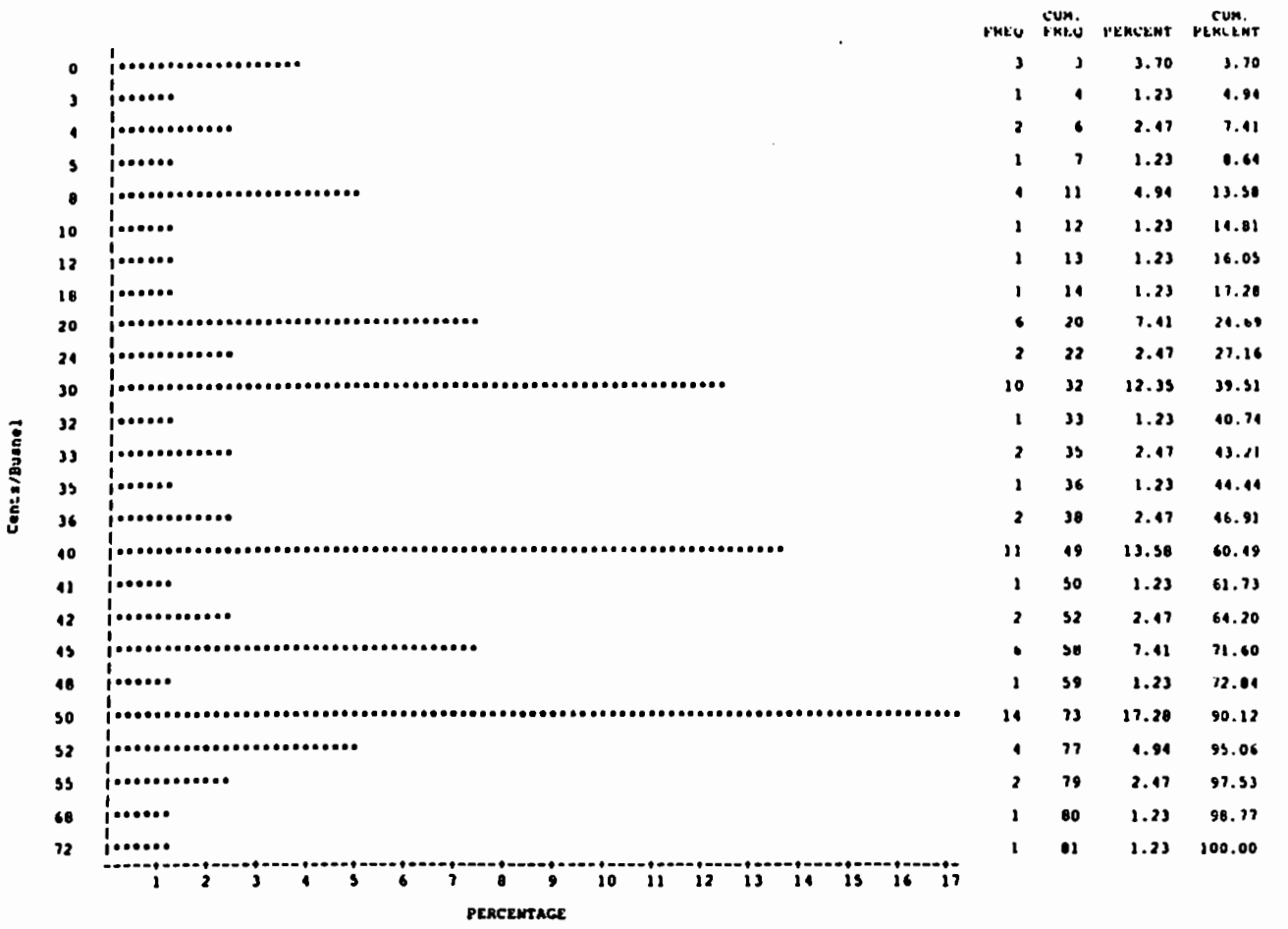



Figure 17. Frequency of Premiums for 16 Percent Protein in HRS Wheat

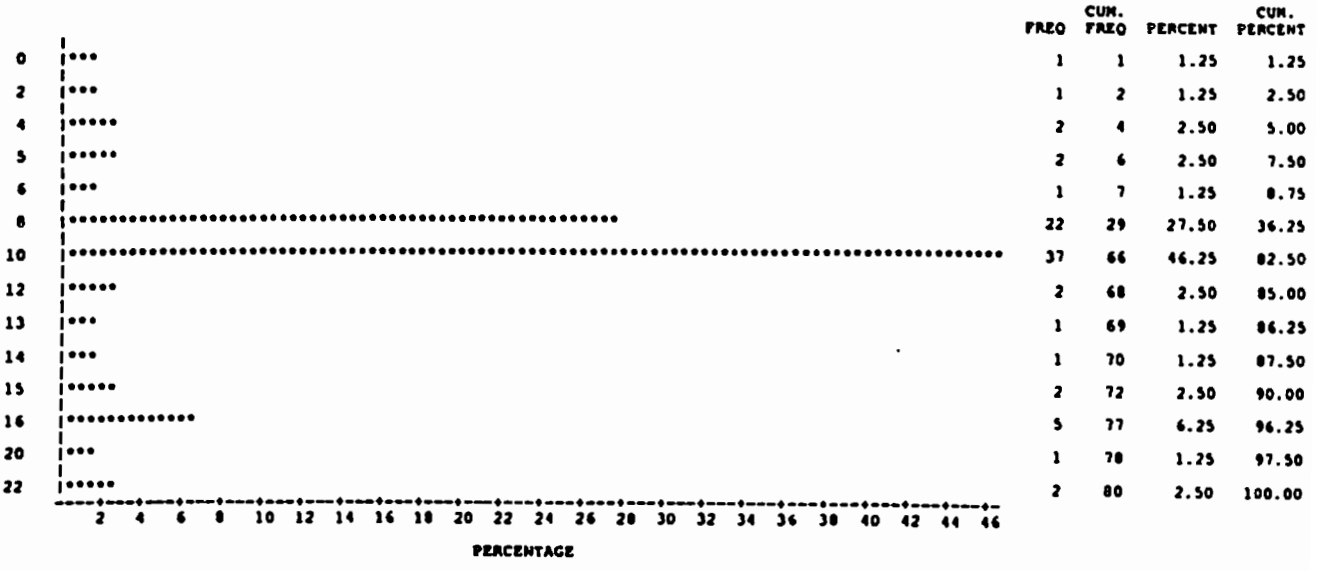
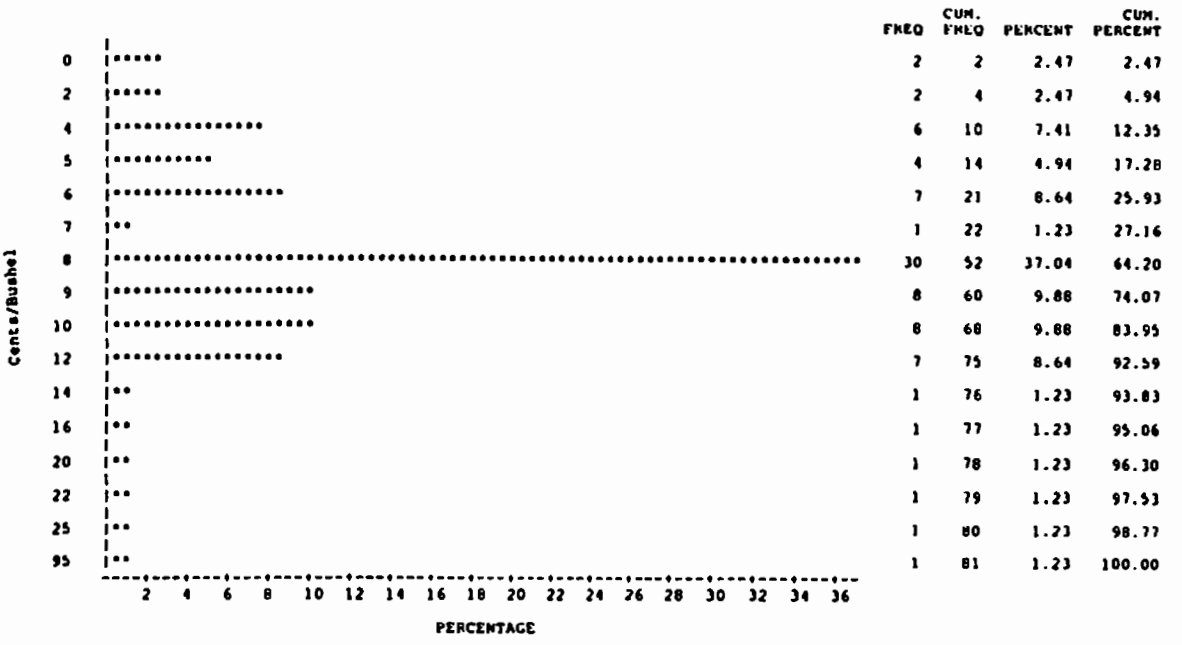
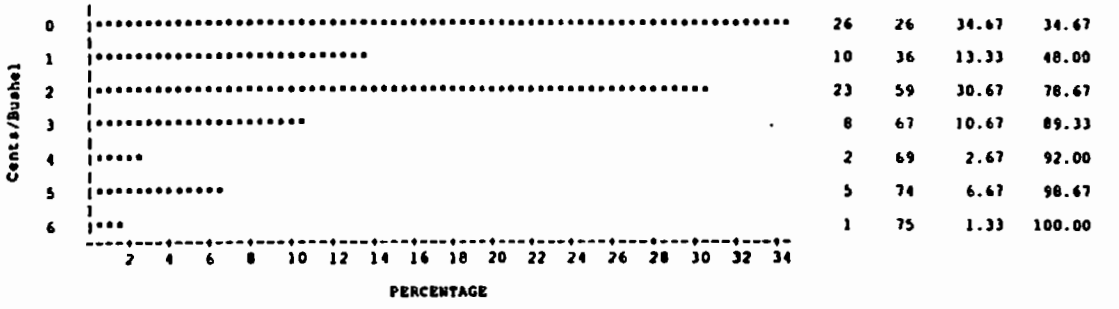



Figure 18. Frequency of Discounts for 12 Percent Protein in HRS Wheat




| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 2 | 2 | 2.47 | 2.47 |
| 2 | 2 | 4 | 2.47 | 4.94 |
| 4 | 6 | 10 | 7.41 | 12.35 |
| 5 | 4 | 14 | 4.94 | 17.28 |
| 6 | 7 | 21 | 8.64 | 25.93 |
| 7 | 1 | 22 | 1.23 | 27.16 |
| 8 | 30 | 52 | 37.04 | 64.20 |
| 9 | 8 | 60 | 9.88 | 74.07 |
| 10 | 8 | 68 | 9.88 | 83.95 |
| 12 | 7 | 75 | 8.64 | 92.59 |
| 14 | 1 | 76 | 1.23 | 93.83 |
| 16 | 1 | 77 | 1.23 | 95.06 |
| 20 | 1 | 78 | 1.23 | 96.30 |
| 22 | 1 | 79 | 1.23 | 97.53 |
| 25 | 1 | 80 | 1.23 | 98.77 |
| 95 | 1 | 81 | 1.23 | 100.00 |

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




| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 26 | 26 | 34.67 | 34.67 |
| 1 | 10 | 36 | 13.33 | 48.00 |
| 2 | 23 | 59 | 30.67 | 78.67 |
| 3 | 8 | 67 | 10.67 | 89.33 |
| 4 | 2 | 69 | 2.67 | 92.00 |
| 5 | 5 | 74 | 6.67 | 98.67 |
| 6 | 1 | 75 | 1.33 | 100.00 |

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

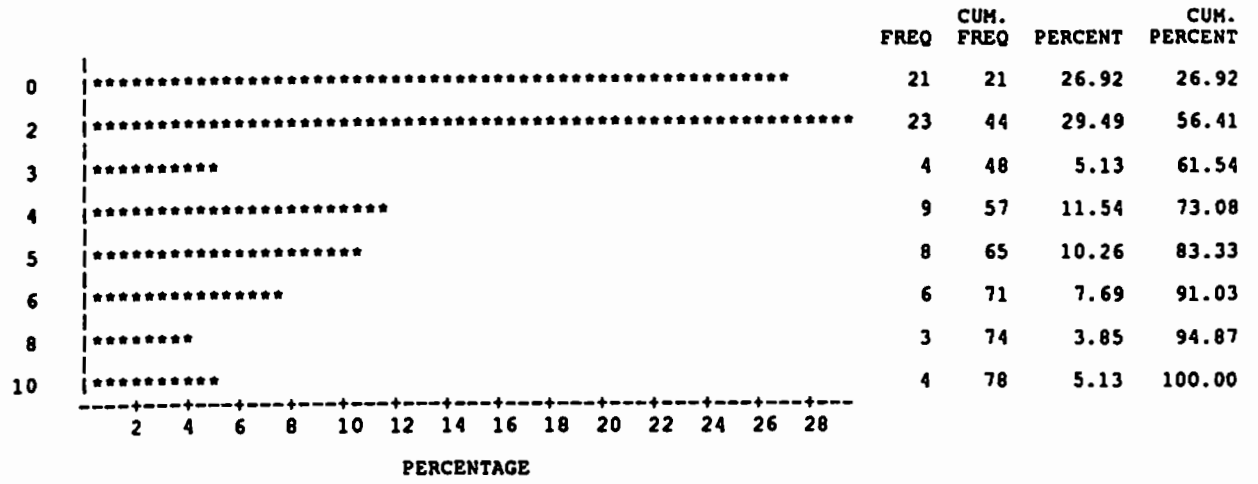



Figure 21. Frequency of Discounts for 5 Percent Shrunken and Broken Kernels in HRS Wheat

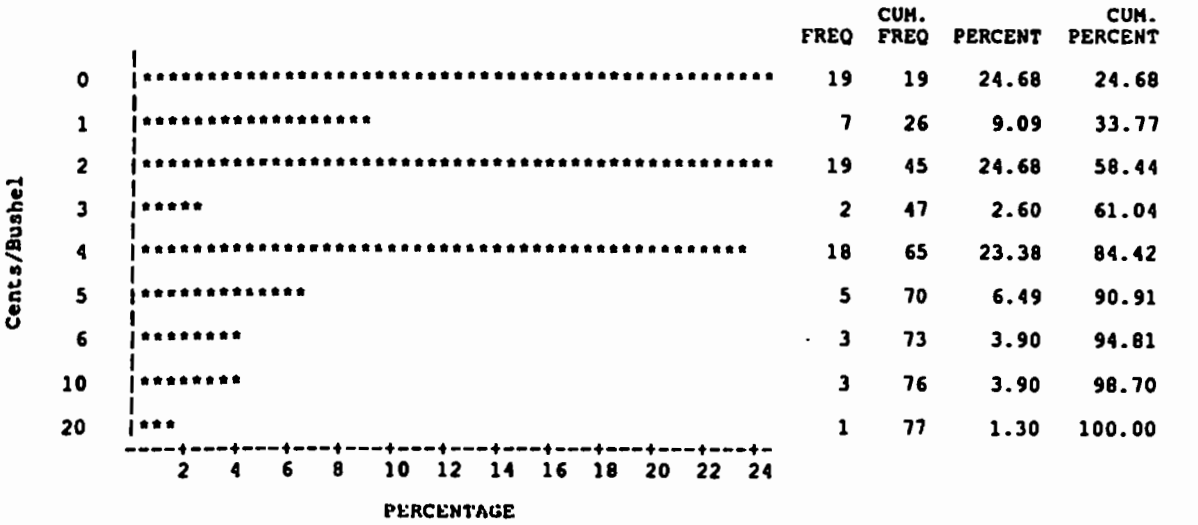
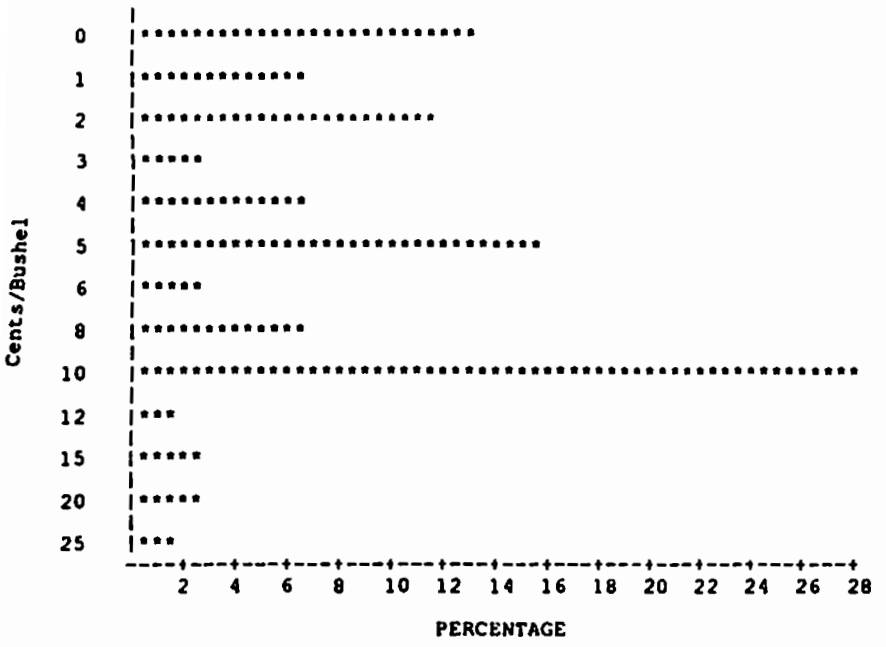



Figure 22. Frequency of Discounts for 2 Percent Contrasting Classes in HRS Wheat




| | FREQ | CUM. FREQ | PERCENT | CUM. PERCENT |
|---|---|---|---|---|
| 0 | 10 | 10 | 12.82 | 12.82 |
| 1 | 5 | 15 | 6.41 | 19.23 |
| 2 | 9 | 24 | 11.54 | 30.77 |
| 3 | 2 | 26 | 2.56 | 33.33 |
| 4 | 5 | 31 | 6.41 | 39.74 |
| 5 | 12 | 43 | 15.38 | 55.13 |
| 6 | 2 | 45 | 2.56 | 57.69 |
| 8 | 5 | 50 | 6.41 | 64.10 |
| 10 | 22 | 72 | 28.21 | 92.31 |
| 12 | 1 | 73 | 1.28 | 93.59 |
| 15 | 2 | 75 | 2.56 | 96.15 |
| 20 | 2 | 77 | 2.56 | 98.72 |
| 25 | 1 | 78 | 1.28 | 100.00 |

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

# Appendix C

# *GRAIN MARKETING QUESTIONNAIRE*

(Fall 1990)

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? _____

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

15. What was your board price for #1 Hard Amber Durum (milling) on December 5, 1990? _____

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 December 5, 1990? _____

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