



United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-255567

November 1, 1993

The Honorable Kent Conrad
United States Senate

Dear Senator Conrad:

Heavy rains in eastern North Dakota and parts of Minnesota this summer severely damaged portions of this year's small-grain (spring wheat, durum wheat, barley, and oats) crop. This damage included widespread contamination by vomitoxin, a fungal toxin. In your August 31, 1993, letter, you asked us to investigate why producers in these states were forced to accept steep and inconsistent discounts in the prices paid for their commodities. As agreed with your office, we addressed the following questions:

- Did market conditions justify deep discounts in grain prices or did buyers use crop conditions as an excuse for large discounts?
- Do the large grain companies use a systematic discount system for low-quality grain? If so, what are the components of that system?
- Are large grain buyers blending lower-quality grain with higher-quality grain and then reselling it at more normal prices?

In addressing these questions, we focused our review primarily on wheat because it accounts for about 75 percent of the small-grain acreage planted in North Dakota in 1993.

We also identified ongoing or planned research aimed at determining whether there were pricing distortions in the grain markets.

In summary, we found the following:

- Several market factors, including buyers' uncertainty concerning grains' quality and supply and a change in

the Food and Drug Administration's (FDA) vomitoxin advisory level, contributed to the levels of discounts for low-quality or damaged grain. These factors, however, also contributed to increased premium prices for higher-quality grain.

- Grain buyers, including large grain companies, have systematic processes for setting discounts and premiums.
- Buyers are frequently blending low-quality grain with higher-quality grain. In the United States, this is a typical industry practice that is used to create a uniform product that meets market standards, something particularly important at times of low quality.
- Two research efforts, one under way and one planned, should provide some information about the presence of price distortions caused by the potential market power of large grain buyers.

BACKGROUND

Heavy rains in eastern North Dakota and parts of Minnesota in 1993 caused several major quality problems for wheat grown in the area, including scab, vomitoxin, and low test weight. Scab is a fungus disease that causes yield losses and poor grades. It may be associated with fungal toxins (mycotoxins), which are potential health hazards to animals and humans. In grading grain, scab is considered part of the Federal Grain Inspection Service's (FGIS) total damage-grading factor. Vomitoxin, which can result from scab, is a toxin that can cause sickness in humans and animals. In addition, vomitoxin can negatively affect the baking quality of flour and the taste of baked goods. FDA issues advisory levels on vomitoxin.¹ Low test weight,² another FGIS grading factor, results in low milling yield.

¹FDA (1) believes that products with vomitoxin levels at or below the advisory levels should not present a public health hazard and (2) is not prepared to take regulatory action when products contain vomitoxin at these levels.

²Test weight is weight per unit volume as measured in pounds per bushel.

MARKET CONDITIONS CONTRIBUTED TO UNUSUAL PRICING

A number of unusual conditions resulted in high uncertainty in the 1993 grain markets in eastern North Dakota and parts of Minnesota. The high level of uncertainty contributed to unusually high premiums and discounts in grain prices. While we found several strong indications that market forces were at work in setting prices, we did not perform a more definitive test for the presence of price distortions caused by the potential market power of large grain buyers. Such an analysis requires an in-depth review of pricing behavior over an extended period.

Unusual Conditions Resulted in High Market Uncertainty

At the beginning of this year's wheat harvest in eastern North Dakota and parts of Minnesota, a number of unusual conditions caused a high degree of uncertainty in the wheat market. These unusual conditions included widespread occurrence of vomitoxin, FDA's review of its advisory levels on vomitoxin, a late harvest, and limited ending stocks from last year's crop to use for blending with this year's low-quality crop.

While some vomitoxin is always present in the wheat crop, previous vomitoxin outbreaks only involved "pockets" of affected grain that buyers would blend into the larger quantities of better grain. This year, vomitoxin was not confined to pockets but affected large areas. In North Dakota, the Department of Agriculture's (USDA) Agricultural Stabilization and Conservation Service showed that 19 out of the state's 53 counties had 50 percent or more of the samples test positive for vomitoxin. An additional six counties had vomitoxin present at undetermined levels. In addition to being more widespread than normal, the vomitoxin was at levels that were higher than in the past. For example, North Dakota State University's sample results showed vomitoxin levels in North Dakota hard red spring wheat as high as 26 parts per million (ppm) and averaging 6.01 ppm through September 1, 1993. These levels greatly exceeded FDA's advisory levels for milling wheat. (See below.) Buyers told us that in this situation, they were not certain they would be able to obtain grain of sufficient quality to meet their needs and this affected the levels of premiums and discounts offered.

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Because of the high levels of vomitoxin, FDA initiated a review of its advisory levels for vomitoxin this year. In 1982, FDA established advisory limits on vomitoxin that were as follows:

- For human consumption, 2 ppm for vomitoxin in wheat intended for milling and 1 ppm in the finished wheat products.
- For wheat and wheat products that are used as animal feed, 4 ppm.

Concerns about the outcome of FDA's review further contributed to the market's uncertainty. For example, grain buyers were concerned about possible regulatory action by FDA, which could include the seizure of grain with high vomitoxin levels. Grain buyers told us that they offered higher discounts for vomitoxin-contaminated grain to compensate for this risk.

Furthermore, this year's grain harvest also started unusually late. For example, the spring wheat harvest in North Dakota was the latest in recent history, slightly behind last year's record late harvest. Specifically, as of September 19, 1993, spring wheat was 68 percent harvested, compared with 72 percent last year and 94 percent in an average year. Durum and barley harvests were also delayed.³ As a result, the market was uncertain about how much better-quality grain it could or should expect in the future. Because the wheat that had been harvested was of low quality and the rest of the harvest was delayed, buyers were uncertain about the value of the small volume of wheat initially harvested. This made pricing very difficult.

Finally, ending stocks from last year were low. This meant that there was little quality grain available to blend with the low-quality grain available early in the harvest. Buyers were uncertain of how much quality grain they could expect from this year's harvest. Because of vomitoxin contamination, blending was necessary to meet marketing standards, which generally follow FDA's advisory levels. Cleaning the contaminated grain--an alternative

³The percentages harvested as of mid-September this year, last year, and on average for durum were 40, 52, and 90, respectively, and for barley were 84, 88, and 97 percent, respectively.

to blending--is costly and does not guarantee vomitoxin's removal. As a result of their uncertainty, buyers offered higher discounts to discourage producers from selling large amounts of low-quality wheat that would be costly to prepare for market.

Indications Are That Market Forces Were at Work

We found several strong indications that market forces were at work in the setting of prices. Initially, when uncertainty about the availability of quality grain was at its peak, steep premiums for high-quality grain accompanied steep discounts for low-quality grain. As more information became available about the extent of low-quality wheat and opportunities to market it, buyers began to adjust the level of discounts offered on the basis of their perception of risk. Later, when FDA finished its review of the vomitoxin advisory levels and more better-quality wheat became available, uncertainty about vomitoxin levels that would be acceptable by the market decreased as did the vomitoxin discounts.

Early in the harvest, buyers were uncertain of their ability to acquire sufficient high-quality grain as well as the outcome of FDA's review of its vomitoxin advisory levels. During this period, buyers of grain, particularly in the hard-hit areas, were reluctant to buy any severely damaged grain. While some refused to purchase damaged grain, others offered steep discounts.

Initially, when uncertainty and discounts were high, extension services and grain elevators encouraged farmers to hold on to their grain until the market settled and more information became available. Producers with severe quality problems may have been eligible for benefits from federal programs such as Federal Crop Insurance and Disaster Assistance. Producers and buyers we spoke with told us that most producers were in a position to respond to the market signals. These producers stored their grain and avoided the steep discounts offered during the period of high uncertainty. However, some farmers had to sell at very high discounts. These were primarily farmers who did not have storage facilities on the farm or drying equipment, could not afford to store their grain at an elevator, and/or needed cash to cover their operating expenses. These individuals were negatively affected by price discounts for high vomitoxin, damaged kernels, and low test weights. For example, one elevator operator told

us that he purchased wheat at a discount of up to \$1.31 per bushel.

During this period, as buyers heavily discounted damaged grain, good-quality grain received steep premiums. For example, cash bids for milling-quality wheat were very strong in August.⁴ The grain trade perceived that this wheat was scarce and was aggressively bidding for it. For example, premiums averaging as high as \$1.90 per bushel were offered for 14-percent protein wheat.

As more information became available about the extent of the damage, the availability of better-quality grain to be used for blending, and the markets available for the grain, elevators and grain companies adjusted their discounts depending on their individual situation. This resulted in some variation in discounts being offered. For example, two neighboring elevators in eastern North Dakota offered different discounts. One elevator was part of a vertically integrated grain company, while the other was a farmer-owned cooperative. The manager of the latter told us that the grain company's elevator was able to offer more-lenient discounts because of lower risk: As part of a vertically integrated company, it had more access to information, blending material, and a guaranteed buyer. The neighboring cooperative elevator, according to its manager, had to offer higher discounts, even though it was under pressure from its customers to lower them. This elevator did not have a guaranteed outlet for its grain, and purchasing high-vomitoxin grain could mean selling it later at very steep discounts or even not being able to find a buyer at all.

In another example, neighboring elevators in Minnesota offered different discounts. The elevator operator that offered the higher discounts told us that he felt he might lose some longtime customers to his competition, but he had to offer the higher discounts to cover the risk of not being able to sell low-quality grain. He added that he assumed his competitor could offer a more lenient discount because it had already found a market that would accept low-quality grain. The market that the elevators were

⁴Milling-quality wheat is a market standard that is higher than FGIS No. 1 grade. Requirements for milling wheat typically include 1.2-percent damage or less, a test weight of 58 pounds or more, and a moisture content of 13.5 percent or less.

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selling to dictated the discounts; for example, milling- and nonmilling-quality markets offered different discounts for vomitoxin-contaminated grain.

Buyers also adjusted their discounts in response to FDA's September 16, 1993, announcement of its update on vomitoxin. The new advisory levels, which were more lenient than the previous ones, removed much of the uncertainty in the market and worked to stabilize prices and discount schedules. The new advisory levels are

- 1 ppm for finished wheat products (and no advisory level for wheat intended for milling),
- 10 ppm for grain and grain by-products destined for ruminating beef and feedlot cattle older than 4 months and for chickens, and
- 5 ppm for grain and grain products destined for swine and other animals.

After the FDA action, most vomitoxin discounts for wheat significantly dropped or disappeared because uncertainty about the marketability of vomitoxin-contaminated wheat abated. At the same time, more information became available about the supply of better-quality wheat in western North Dakota and in Montana. Currently, vomitoxin discounts are generally being applied only to milling-quality wheat.

MOST BUYERS USE SYSTEMATIC METHODS
TO CALCULATE PREMIUMS AND DISCOUNTS

On the basis of evidence we collected, buyers of grain, including elevators and grain companies, generally have systematic means of setting discounts and premiums. FGIS- and established market-grading factors tend to be used in setting discounts and premiums. FGIS-grading factors include test weight, damage, and foreign material. Established market-grading factors include other specifications, such as protein levels in the grain. Premiums and discounts for these factors have been generally consistent for similar-quality crops. Buyers-- grain companies, millers, and other end-users--generally offer elevators price bids that include premiums and discounts for specific quality levels. The price schedules that elevators offer to producers are based on these bids plus freight and a margin to cover the elevators' operating costs. Prices offered also can take

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into account more unusual quality factors, such as vomitoxin, that could negatively affect the marketability of grain.

BLENDING IS A COMMON INDUSTRY PRACTICE

Buyers purchased low-quality wheat at a discount and blended it with better-quality grain. While they may have sold the blended grain at higher prices than the price they paid for the low-quality grain, they also incurred blending costs. If buyers bought low-quality grain at a discount, they also most likely bought high-quality grain at a premium.

Blending is a standard industry practice in the United States that ensures the flow of grain and benefits both the producers and buyers of grain, as well as other related industries, such as the railroad industry. Blending low-quality grain with higher-quality grain makes it possible for the buyers to meet established grade or market standards and provide end-users with the quality that will meet their needs. If it were not for blending, many farmers who produced low-quality grain this year might not have sold their grain at all. We believe that the blending option was what eventually allowed buyers to start buying low-quality grain that they would not have bought otherwise.

OTHER RESEARCH IS ONGOING

We identified two research efforts, one ongoing and one planned, aimed at determining whether there were pricing distortions in the grain markets. A professor of agricultural economics at North Dakota State University is working on a study, expected to be completed by the end of 1994, that examines the value of wheat with vomitoxin. He is doing an economic analysis of the appropriate discount level for vomitoxin-contaminated wheat. His study will incorporate the risk levels that the intermediate buyers must face as well as the costs of cleaning and testing the wheat. USDA's Economic Research Service (ERS) is planning a second study in cooperation with Ohio State University that will address market power for a full array of agricultural commodities, including grain. They are currently identifying data sources within USDA. According to the Chief of Marketing Economics, ERS, this research effort will take about 2 years to complete.

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We also found that the Department of Agricultural Economics at North Dakota State University had considered conducting a study of the overall economic effects of this year's adverse weather in the state of North Dakota. This study was canceled because there were indications that government programs offset crop losses for many farmers, and high prices for milling-quality wheat partly offset the impact of lower prices for lower-quality wheat.

SCOPE AND METHODOLOGY

As agreed, we obtained qualitative information to respond to your questions by interviewing major players in the production and marketing of grain. In order to meet your time frame, our work was limited to information we were able to gather between September 7 and October 8, 1993. During our interviews, we obtained a limited amount of readily available documentation related to discounts and premiums offered.

We conducted interviews with

- producers and producers' groups,
- grain elevator operators,
- grain companies,
- academicians,
- the Commissioner of Agriculture in North Dakota,
- FGIS/USDA,
- the Agricultural Stabilization and Conservation Service/USDA,
- the North Dakota Agricultural Statistics Service/USDA,
- ERS/USDA, and
- FDA.

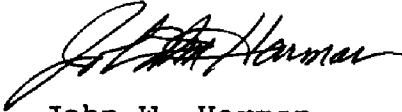
We also attempted to identify other research efforts and data sources that might be used to quantify how much, if any, market distortion exists.

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We hope that this information is helpful to you. Please contact me at (202) 512-5138 if you or your staff have any questions.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "John W. Harman".

John W. Harman
Director, Food and
Agriculture Issues