2001-2002 VALUE-ENHANCED GRAINS QUALITY REPORT PRODUCER SURVEY RESULTS

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paper presented at the

Symposium

"Product Differentiation and Market Segmentation in Grains and Oilseeds: Implications for Industry in Transition"

Sponsored by
Economic Research Service, USDA
and
The Farm Foundation

Washington, DC

January 27-28, 2003

2001-2002 VALUE-ENHANCED GRAINS QUALITY REPORT
PRODUCER SURVEY RESULTS

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This document provides a summary of the producer survey performed as part of the 2001-2002 Value-Enhanced Grains Quality Report published by the US Grains Council. Ag Education & Consulting prepared the Report in the spring of 2002. The full Report is available at the Value-Enhanced Grains web site, www.vegrains.org.

Producers have been surveyed for the past seven years to gather information about general corn production, value-enhanced corn (VEC) production, on-farm storage and drying, and future plans for VEC and GMO production. This collection of data provides insight on the past trends and future direction of the VEC industry. In 2001, 1,742 responses were received from producers in the seven-state region of Illinois, Indiana, Iowa, Minnesota, Missouri, Nebraska, and Ohio.

Survey Data

Table 1 shows the number of surveys sent and received for the producer and elevator surveys. In late 2001 surveys were sent to just over 5,600 producers who grew corn in the seven targeted states, and 1,742 responses were received. Respondents to the survey represented approximately 1.2% of the total U.S. corn production in 2001. Maps identifying the location of producer respondents (Figure 1) and those respondents who were growing VEC products (Figure 2) are shown.

Table 1. Survey Respondents

Type	1995	1996	1997	1998	1999	2000	2001	Repeat Resp.
Producers								
Surveys sent	3,500	4,700	5,535	3,323	4,527	4,208	5,667	
Responses received	1,354	1,619	1,837	1,523	1,724	1,343	1,742	438
Response rate	39%	34%	33%	46%	38%	32%	31%	

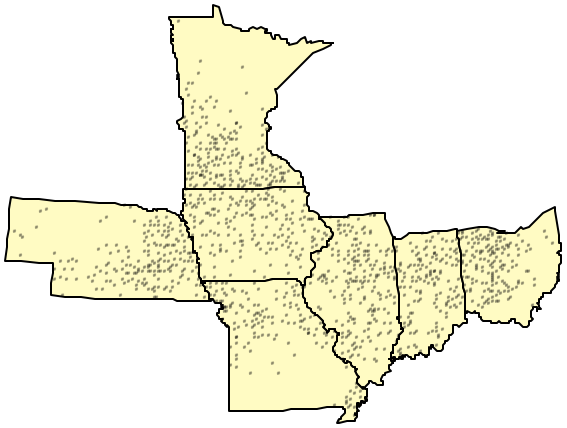

Figure 1. Producer Respondent Locations

438 of the producer respondents to this year's survey were also respondents to the same survey used in the previous six years of this study. Several important findings were gathered by comparing the responses from the same producers over a seven-year period.

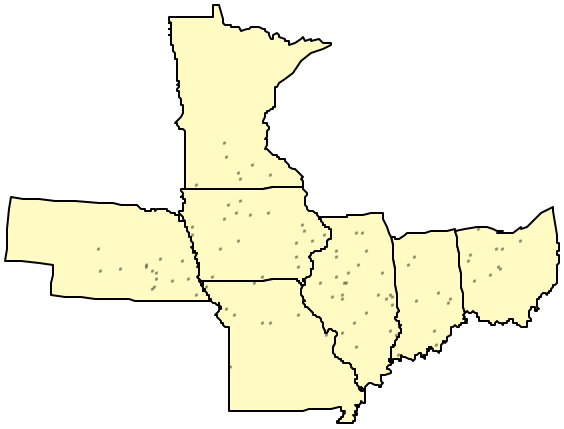

Figure 2. Producer Respondents Growing VEC Products

VEC Production

The portion of the respondents growing some type of VEC in 2001 was approximately 12.3% compared to 14.2% in 2000. Three percent of the respondents grew high oil corn in 2001, 2% grew low-temperature dried/low stress crack corn, 3% grew white corn, 2% grew hard endosperm/food grade corn, 2% grew segregated non-GMO, and 1% grew waxy corn. These figures sum to more than 12.3% since some producers grew more than one type of VEC.

Production of VEC that excludes non-GMO, low-temperature dried (LTD) and low stress crack (LSC) corn increased steadily from 1996 to 2000. As a percent of total production, only 3.3% in 1996 was VEC, but increased steadily to 6.2% in 1999. Beginning in 2000, the corn producer surveys included segregated non-GMO, LTD and LSC corn as VEC products. In 2001, the segregated non-GMO volume was 2.0% of the total corn volume and the combined low temperature dried/low stress crack volume was 1.0% of the total corn volume. As shown in Figure 3, total VEC volume fell from 11% in 2000 to just over 7% of total corn volume in 2001.

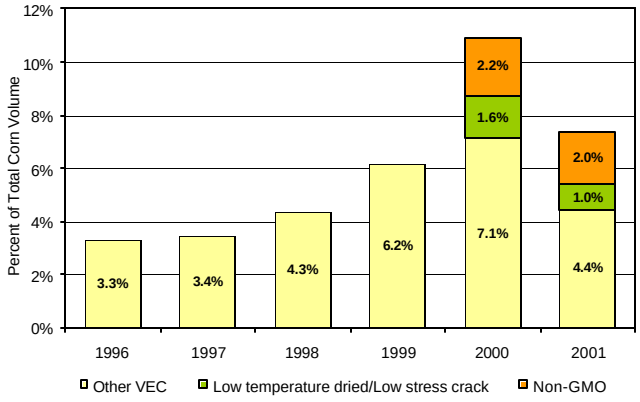

Figure 3. VEC as a Percent of Total Corn Production

Figure 4 shows the percent of volume of VEC production with specialized compositional traits from 1996 to 2001. Over the past six years, production of hard endosperm/food grade corn has experienced the widest variation in production of these products. High oil corn has experienced the second highest degree of variability in production, yet has had the highest proportion of total production over the six-year period. White corn is the VEC crop with the second highest average percent of production during this period.

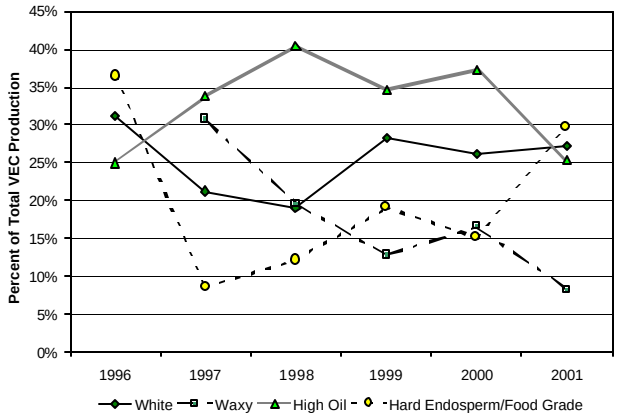

Figure 4. Share of VEC Production with Specialized Compositional Traits

The average premiums received by the responding producers for the four main VEC products with specialized compositional traits are presented in Figure 5. All the premiums continued a downward trend from their peak in either 1998 or 1999. In addition, the range in which the average premium falls is narrowing. Producers raising white corn received the highest and farmers growing hard endosperm varieties received the lowest average premiums over the six-year period. Premiums received for white corn have experienced the widest variation from year to year while hard endosperm premiums have varied to a lesser degree.

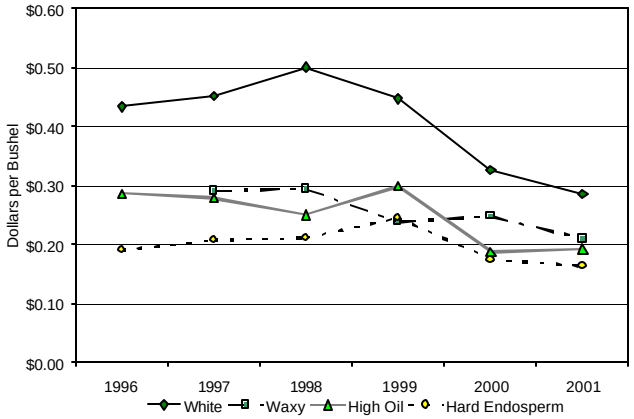

Figure 5. Average VEC Premiums Paid to Producers

The producers were asked for a second year in a row about VEC with specialized management and handling traits such as low stress crack, organic, low-temperature dried, and post-harvest pesticide-free. Two percent of the responding producers grew VEC with specialized management and handling traits, and their production of these products represented 0.6% of the total corn production. Around one-third of the producers grew these VEC products under contract. Premi-

ums for corn with these specialized management and handling traits ranged from $0.02 per bushel for LTD corn to $1.75 per bushel for organic corn.

In the past, VEC producers have had slightly different characteristics from non-VEC producers. Table 1 compares some of the characteristics of this year's respondents who have grown VEC to those who have never grown VEC. Twenty-six percent of the producers are either current or past VEC growers. This group of respondents had a slightly higher average corn yield and significantly greater number of average corn acres in 2001 than the non-VEC growers. However, the two groups of producers have similar storage characteristics. About the same proportion of producers in each group have on-farm storage. Current or past VEC growers have more on-farm storage capacity than producers who have never grown VEC. This greater storage capacity may be attributed to the greater number of acres VEC growers produce. Nonetheless, the average storage capacity to production ratio (a concept introduced in the "On-Farm Storage and Handling" section) for each group is about the same. Therefore, the greater storage capacity is most likely attributed to the larger farm size, not to storage requirements of VEC.

Table 2. VEC Producer Characteristics

	Growers of VEC in the Past	Never Grown VEC
Percent of respondents	26%	74%
Average corn yield (bu/acre)	150	145
Average corn acres	531	441
Percent with on-farm storage	94%	93%
Average on-farm storage capacity (bu)	83,974	63,676

Turnover rates in VEC growers were calculated based on the survey results (Figure 6). Of the producers raising VEC in 2001, 27% do not plan to grow any type of VEC in 2002. Twenty-nine percent of the expected VEC growers in 2002 did not grow VEC in 2001. While the turnover rate in VEC growers has been high for the last two years, it is expected to be lower than a year ago (30% of the producers growing VEC in 2000 did not plan to grow VEC in 2001.)

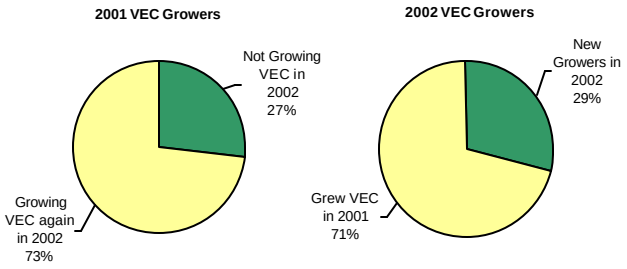

Figure 6. VEC Producer Turnover

Historically, it has been believed that yield drag is a reason for producers to either not grow VEC or stop growing VEC. The 2001 producer survey results support that assumption. Figure 7 shows the average VEC yields relative to the producers' average commodity yields for 2001 VEC growers. For the four products shown, VEC yields are consistently less for those producers not planning to grow VEC in 2002 than for the producers planning to grow VEC in 2002. While yield drag was non-existent for high oil and hard endosperm corn growers that plan to raise VEC again, those not planning to grow VEC experienced the greatest yield drag. These results indicate that yield drag may have contributed to the decision not to grow VEC again, especially those growing high oil and hard endosperm corn.

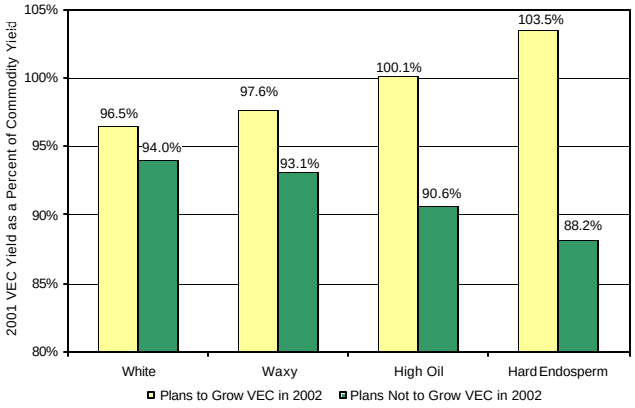

Figure 7. Relative 2001 VEC Yields for Producers Growing and Not Growing VEC Again in 2002

Survey results show that 13% of the respondents plan to raise VEC in 2002. Of the producers who plan to raise VEC in 2002, 20% of the respondents identified themselves as new growers while 57% stated that they plan to grow the same acreage as before (Figure 8). Only 17% of the respondents indicated that they would plant more VEC acres next year compared to 2001. The proportion of growers increasing their acreage has declined since 1998. In 1998, about 31% estimated that they would be increasing their VEC acreage. About 6% of the producers responding in 2001 plan to decrease their VEC acres in 2002, compared to 12% a year ago.

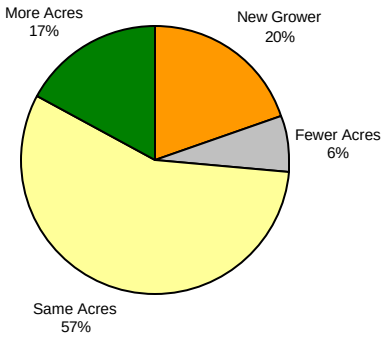

Figure 8. Percent of Expected 2002 Growers' Acreage

Producers who grew VEC in 2001 were asked about factors that may have influenced their decision to grow VEC. On a scale of 1 to 5, they rated the level of importance of five factors (Figure 9). Premiums received the highest rating, while previous good results was the second most important factor for deciding to grow VEC.

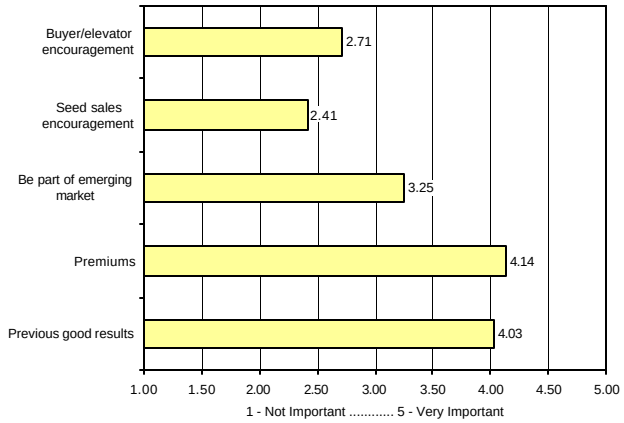

Figure 9. Reasons for Growing VEC

Producers who did not grow VEC in 2001 were also asked to rate factors that may have influenced their decision not to grow VEC (Figure 10). It is interesting to note that the highest rated factor influencing the decision not to grow VEC is the lack of sufficient incentives or premiums. This demonstrates the importance of perceptions, because premiums are the primary factor for both growing and not growing VEC. It also appears that premiums or perceptions of the value of premiums are not universal across Midwestern corn production. The second most influential factor for not growing VEC for these producers is limited markets or contracts. Poor prior experience with VEC production and perceived risk associated with VEC are rated as the least important factors when the respondents decided not to grow VEC.

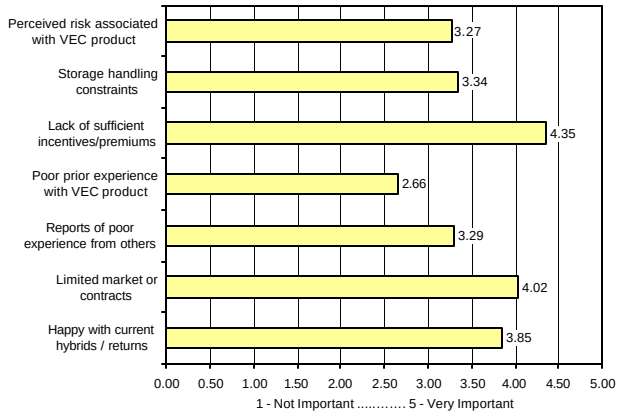

Figure 10. Reasons for Not Growing VEC

Producers were asked their opinion about the demand for VEC over the next five years. The largest proportion of respondents (47%) indicated that they believe the VEC market is stable with little growth. A smaller percentage (41%) expects a growing VEC market with increased demand, while 12% of the respondents feel there will be a declining market with lower demand over the next five years.

The 2001 producer survey asked the respondents about their use of Bt, LibertyLink®, and Roundup Ready® varieties of GMO corn in 2001 and 2002. Figure 11 shows the portion of total corn acres the producers planted of each corn type in 2001 and expect to plant in 2002. However, producers can grow corn with more than one GMO trait, thus there is some overlap of the GMO acreage among varieties. When the overlapping acres are accounted for, 30.1% of the respon-

dents' total 2001 corn acreage was planted with GMO corn, and the percent of the respondents' 2002 corn acreage is expected to rise slightly to 34.7%. Fifty-six percent of the respondents planted a portion of their 2001 corn acreage with GMO corn, while 60% of the producers intend to plant some portion of their 2002 corn acreage with some variety of GMO corn. This group of producers appears to be increasing its use of GMO varieties in 2002.

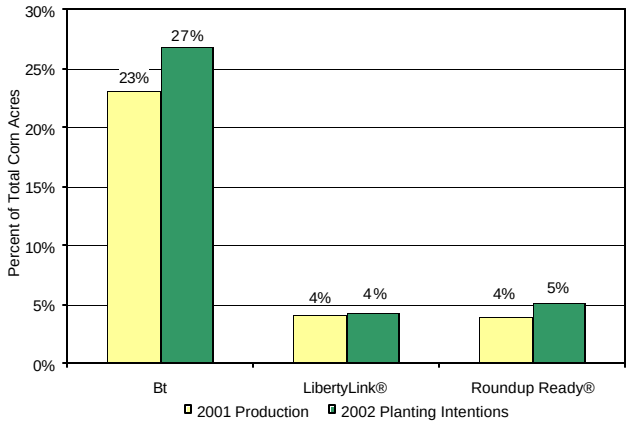

Figure 11. GMO Corn Production

General Production Characteristics

Table 3 shows general production characteristics of the responding producers. The average corn yield reported for 2001 was 146 bushels, the second highest average yield reported from 1997 through 2001, and 2 bushels lower than in 2000.

Table 3. General Characteristics of Producer Responses

	1997	1998	1999	2000	2001
Average corn yield, bu/acre	135	145	140	148	146
Average corn acres harvested	470	446	461	450	471
Avg harvest moisture content, %	20.1	18.3	16.8	16.7	18.2
Portion of production dried on farm	62%	58%	42%	40%	48%
Portion of production stored on farm	62%	64%	65%	67%	64%

Figure 12 presents the 2000 and 2001 yield distributions for the survey respondents. The figure shows a wider range of 2001 corn yields ranging from 10 to 275 bushels per acre than in 2000 (a range of 20 to 215 bushels per acre). The average bushel per acre in 2001 was only two bushels lower than in 2000. However, there were fewer reported average yields in the 150–160 bushel range and more in the 100–130 and 190–200 bushel ranges in 2001 than in 2000. This resulted in a flatter and wider distribution in 2001 than in 2000. The variability in the 2001 yield results was the second highest observed from 1997 to 2001. The standard deviation of the producer corn yields in 2001 was 28.1 bushels per acre while 1999 has the highest variability of 31.4 bushels per acre and 2000 had the lowest variability with 24.4.

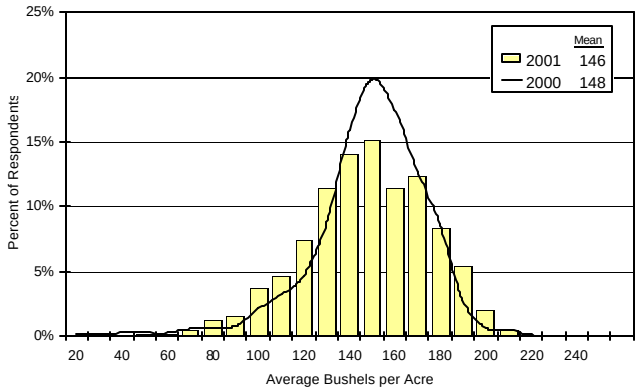

Figure 12. Distribution of Producer Commodity Corn Yields, Producer Survey

The average producer had 471 acres of corn in 2001. Corn acres per farm ranged from less than 20 to almost 8,500 acres. Figure 13 shows the distribution of corn acres per farm. The figure shows that the majority of farms had 200 to 500 acres of corn per farm. However, almost 8% of the respondents had more than 1,000 acres.

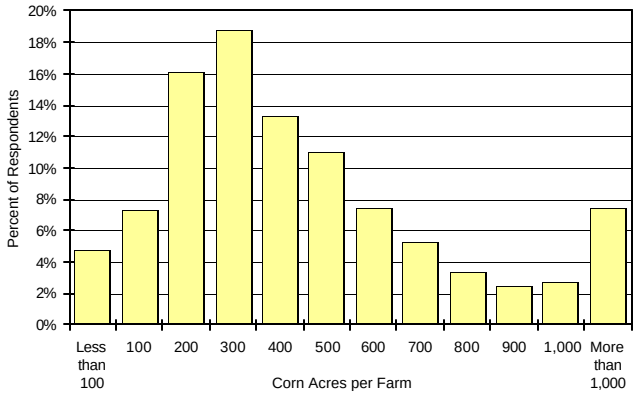

Figure 13. Distribution of Corn Acres per Farm

The average harvest moisture content for all producers surveyed was 18.2% in 2001, 1.5% higher than the 2000 average of 16.7%. The seven-year average of average harvest moisture content is 18.7 %, so 2001 harvest moisture was about average for the surveyed years. Figure 14 shows the distribution of harvest moisture reported by the respondents for 2001 and 2000. Eighty percent of the corn harvested by the respondents in 2000 and 2001 had a moisture level between 16% and 21%; however, 48% and 38% of the 2001 and 2000 respondents, respectively, reported moisture levels between 18 and 20%.

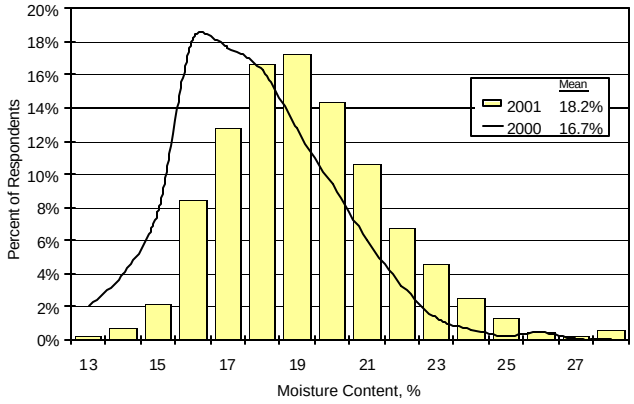

Figure 14. Distribution of Harvest Moisture Content, Producer Survey

On-Farm Storage and Handling

While 95% of the respondents had on-farm storage in 2001, 86% of the producers stored a portion of their 2001 corn crop on their farm. The average storage capacity for the responding producers was over 69,000 bushels. From 1996 through 2001, 62% to 67% of the total corn production of the respondents was stored on farm. In 2001, about 64% of the production was stored on farm, while 12% was stored off farm.

The ratio of farm storage capacity to farm production is a measurement of a farm's capability of storing its production. For example, if a farm produces 100,000 bushels and its storage capacity is 75,000, its storage capacity to production ratio is 75%. In other words, there is storage capacity for 75% of the farm's production. Figure 15 shows the distribution of the storage capacity ratio for the respondents. About 46% of the respondents have storage capacity that exceeds their 2001 corn production.

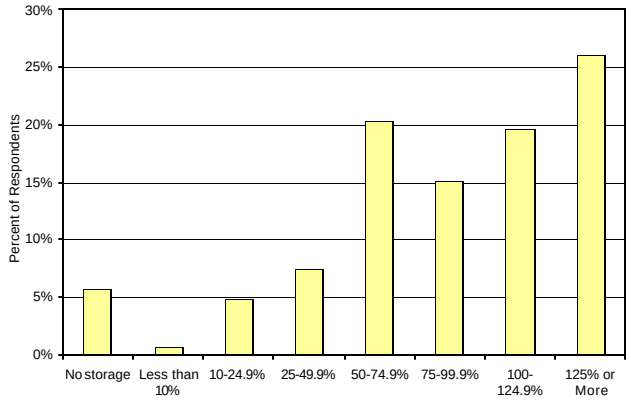

Figure 15. Distribution of Storage Capacity Ratio, 2001 Production

On-Farm Drying

Eighty-seven percent of the producers that responded to the survey stated that they have on-farm drying facilities. Seventy percent of the respondents dried a portion of their 2001 corn crop on farm while 22% of the responding producers dried corn off the farm. Some of these producers dried both on and off the farm, resulting in 77% of the producers drying either on and/or off the farm. Twenty-three percent of the producers did not dry corn either on or off the farm.

Forty-eight percent of the corn produced by the respondents in the seven-state region was dried on farm in 2001. In addition, 10% of the crop was dried off farm in 2001, compared to 8% in 2000 and 9% in 1999. This increase in volume of corn dried is likely due to the higher harvest moisture content in 2001. As discussed in the sample test results section, the increased amount of artificial drying had an impact on quality.

Table 4 shows the characteristics of on-farm drying methods. The use of the "continuous flow" drying method remains the drying method used on the largest portion of corn dried on farm.

This Report defines low-temperature dried corn as corn that has been dried with temperatures less than 120°F. About 34% of the total bushels dried on farm was low-temperature dried in 2001 compared to 37% in 2000. This may be a result of the higher average moisture content at harvest in 2001. Figure 16 shows the distribution of maximum dryer temperatures weighted by drier volume.

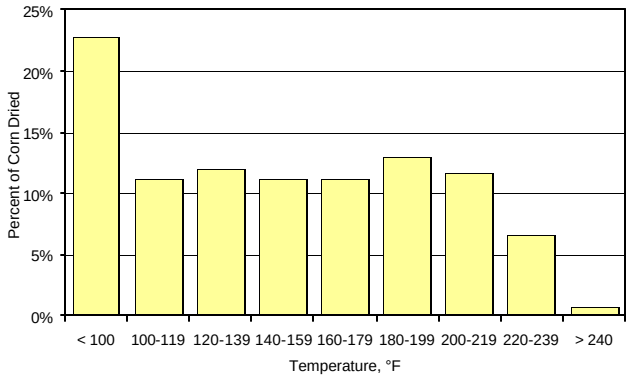

Figure 16. Distribution of Maximum Dryer Temperature

Equipment Changes Planned by Producers

As in previous years, the 2001 survey asked about producers' plans for changes to their grain handling and storage systems. For the past two years, fifteen percent of the respondents plan to make changes to their systems in order to improve the quality of the grain they produce and/or to be able to produce VEC. Figure 17 summarizes the changes the producers are planning, and these results are very similar to the past two years' findings. The most significant finding from this question is that 8.4% of the respondents plan to build new storage bins. This figure has been 8–10% over the last four years. This building could be a result of the need for segregation of value-enhanced crops. Other changes planned by the producers include converting augers to air transfer systems and belt conveyors, replacing augers, and installing a new aeration floor, grain spreader and sweep auger.

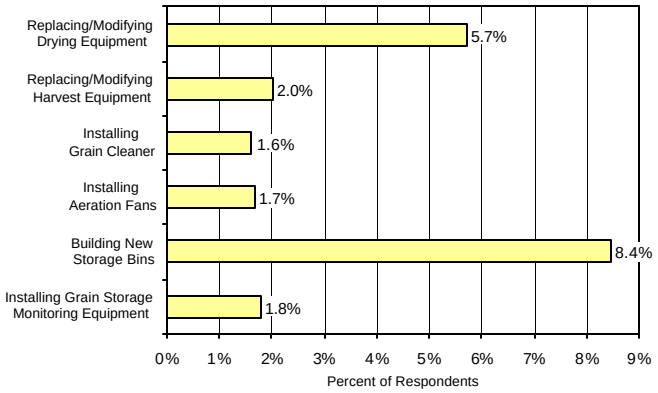

Figure 17. Changes Planned for Grain Storage and Handling Equipment

Summary of Findings from 438 Multiple-Year Producer Respondents

Of the respondents to this year's survey, 438 of the producers were also respondents to the producer survey used for the 1995 through the 2000 Reports. Comparisons between the responses from the producers who have responded to the seven surveys are noted below. Data from this group of producers permit analysis of the same set of farms over a seven-year period.

Table 4. Characteristics of On-Farm Drying Methods

	2001				2000			
Dryer Type	Portion of Total Corn Dried	Average Maximum Drying Temp., °F	Average Points of Moisture Removed	Average Final Moisture	Portion of Total Corn Dried	Average Maximum Drying Temp., °F	Average Points of Moisture Removed	Average Final Moisture
Continuous flow	41%	176	5.2	14.7%	37%	171	4.3	14.6%
Batch	12%	166	5.3	14.5%	12%	167	4.9	14.4%
In-bin heated air	25%	130	5.2	14.5%	26%	127	4.5	14.4%
In-bin air only	22%	Ambient	3.1	14.8%	22%	Ambient	2.8	14.5%
Other	1%	111	4.5	14.5%	2%	117	3.8	14.5%

Average corn acres in 2001 for the repeat respondents were 381 acres. While this average is up by only one acre from 2000, it is down from 418 acres in 1999, the peak of the seven-year period. The average corn yield for this group of producers in 2001 was 151 bushels per acre, the second highest yield for the seven-year period.

The average corn moisture content at harvest for these producers was 18.2% in 2001, slightly lower than the seven-year average of 18.7%. Figure 18 shows the average harvest moisture for this group over the seven-year period.

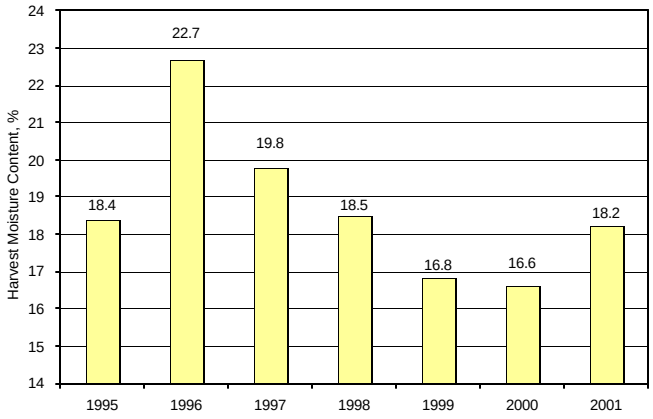

Figure 18. Average Harvest Moisture Content for Repeat Respondents

The amount of corn dried on these farms was up from the previous two years, but was still lower than in 1995 through 1998. Between 1995 and 1998, 62% to 68% of the corn produced by these producers was dried on farm. In 2001, 50% of the corn was dried on farm. Corn dried off farm increased slightly from 11% in 2000 to 12% in 2001.

Figure 19 shows the drying method used as a percent of corn dried on these farms for the past five years. The figure shows that the use of the "in-bin air only" method was relatively high in 1999 through 2001. Again, low harvest moisture content allowed the producers to dry corn adequately without using heat.

The proportion of the repeat respondents raising VEC increased steadily from 1995 to 2000 and declined from 13.5% in 1999 to 11% in 2001. In addition, the percentage of producers planning to grow VEC the following year peaked at 15.6% in 1999 and fell to 11.3% in 2001.

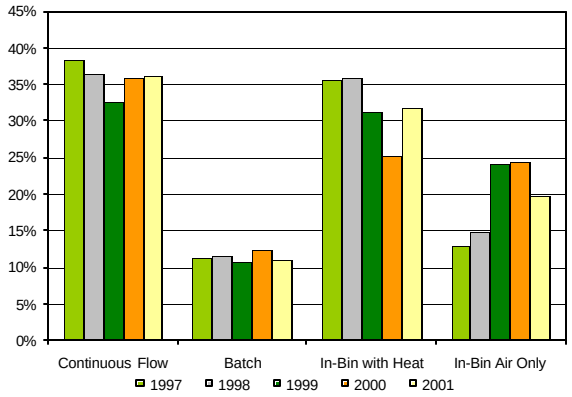

Figure 19. Percent of On-Farm Drying Volume by Drying Method

Production of VEC with specialized compositional traits by this group was about 2.3 million bushels in 2001, representing only a 3% increase from 2000 but a 273% increase since 1995. The product with the largest increase in production was high oil corn. Figure 20 shows the production of three VEC products from the past seven years. Production of these products peaked in 1999 and has declined these past two years.

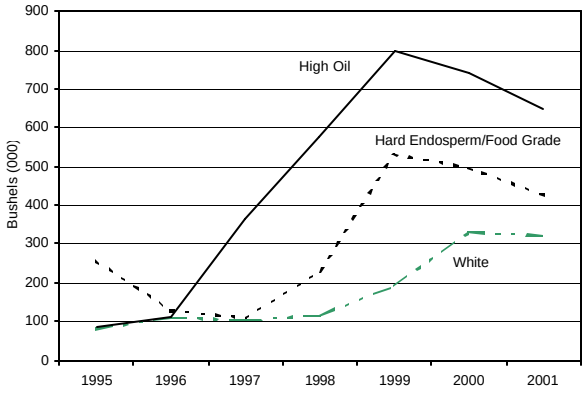

Figure 20. Production of Major VEC Products for Repeat Respondents

The same group of producers was asked both in 1997 and 2001 about their reasons for growing and not growing VEC varieties. Figure 21 shows the summarized responses for their reasons to grow VEC. While the average rating for the reasons are slightly different in 1997 and 2001, the relative rating of the reasons within the year has not changed over the five-year period. In other words, premiums and previous good results were the most and second most important reasons for growing VEC in 2001, just as they were in 1997. The relative importance of reasons for not growing VEC was similar. Insufficient premiums was the most important reason and poor prior experience was the least important reason for not growing VEC in 1997, just as it was in 2001.

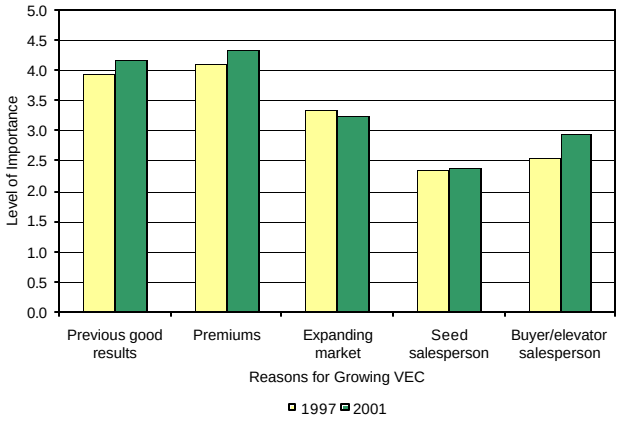

Figure 21. Reasons for Growing VEC for Repeat Respondents, 1997 and 2001