



# Herbicide Selection and Management Practices Associated with Minnesota's 2008 Corn Production

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Minnesota Department of Agriculture  
USDA, NASS, Minnesota Field Office

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## Abstract

The Minnesota Department of Agriculture (MDA) is responsible for the development and promotion of herbicide Best Management Practices (BMPs) which optimize production and profitability while protecting the state's water resources. The MDA is also responsible for monitoring pesticide use and for promoting the adoption of associated BMPs. This survey was designed and conducted in partnership with the National Agricultural Statistics Service (NASS) to specifically assess the status of BMP awareness and adoption in relation to the use of corn herbicides.

In Minnesota, the corn herbicide active ingredients atrazine and acetochlor (and their breakdown products) are detected frequently in groundwater and surface water resources. While atrazine does not exceed the applicable drinking water standards in groundwater, in 2001 and 2005 acetochlor concentrations in two southern Minnesota watersheds exceeded water quality standards to protect aquatic life. The MDA has invested considerable staff time in water monitoring, development of BMP education programs, and BMP assessment. Atrazine and acetochlor are the main focus of this survey. Phone enumerators located at NASS contacted over 4,000 producers in early 2009. From this pool, approximately 2,800 farmers who raised corn during the 2008 growing season shared valuable information on herbicide selection and management.

The general purpose of this survey was to ask farmers about fundamental herbicide use practices such as record keeping, reading the label, scouting, responsibility for making decisions on product selection and timing, and knowledge about physical characteristics (soil texture, depth to groundwater, use of buffer strips, etc). More specific questions related to atrazine and acetochlor included the use of split applications, reduced rates, and incorporation.

These types of surveys help MDA understand regulatory compliance, adoption of voluntary practices, potential informational roadblocks, and opportunities for future technical assistance.

Every other year, the MDA has partnered with NASS to produce a detailed report on pesticide use and rates used on the state's four major crops. Readers are encouraged to visit the most recent report, "2007 Pesticide Usage on Four Major Minnesota Crops" at <http://www.mda.state.mn.us/news/publications/chemfert/2007pesticideuse.pdf>

## Acknowledgements

This survey was a cooperative effort by the Minnesota Department of Agriculture (MDA), the United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS), and the NASS Field Offices in Minnesota and North Dakota. The detailed information about herbicide use practices could not have been collected without the cooperation of the thousands of farmers who voluntarily responded to the survey in the midst of their busy lives, and for this we are extremely grateful. Similarly, the assistance of agricultural chemical dealers and cooperatives is much appreciated. Special thanks go to Doug Hartwig and Dan Lofthus, Director and Deputy Director, respectively of the NASS Minnesota Field Office, Dave Knopf,

Director of the NASS North Dakota Field Office and their respective staff for assistance with survey design, data collection and processing. The MDA is ultimately responsible for the representations of data provided in this report and for the design of the survey mechanism used to collect that data. Excellent participation and good record keeping practices by Minnesota farmers and agricultural chemical dealerships played a vital part in providing complete and detailed herbicide information.

## 2008 Herbicide Use Practices Summary and Highlights

This report summarizes survey results for a number of important practices associated with herbicide use on Minnesota's 2008 corn acres. Over 2,700 producers participated in the telephone survey and herbicide information was collected for 722,007 corn acres, representing 9 percent of Minnesota's seven million corn acres. Survey questions focused on the 95 percent of the respondents that used herbicides for weed control. The survey targeted a variety of practices including herbicide selection and associated management practices (e.g., MDA's herbicide BMPs). This is the third herbicide survey performed by the MDA and NASS to collect information on herbicide management practices on Minnesota corn acres.

## Survey Design and Implementation

Ten Pesticide Monitoring Areas (noted as "PMA" throughout the report), were previously developed by MDA staff. Counties were clustered based on similarities in geology, soils, and crops. These areas also define the general boundaries of the monitoring regions used by the MDA water resource monitoring program. More information about PMA designations can be found at <http://www.mda.state.mn.us/chemicals/pesticides/~/media/Files/chemicals/2009gwmnetdesign.ashx> Regional pesticide use information is used to help design and implement specific water quality monitoring and pesticide educational programs.

NASS developed a sampling population of 7,000 farms by randomly drawing from its entire database of all corn growers in Minnesota. There were 2,765 farmers that raised corn in 2008 and that completed the survey. The definition of "corn" for purposes of this report includes both grain and silage and excludes sweet corn and popcorn. All growers were asked four basic questions regarding herbicide selection and management. The remaining questions were for those farmers who used atrazine or acetochlor.



Due to the low intensity of row crop agriculture in portions of northern Minnesota, survey results for PMA 2 and PMA 3 were not reported separately.

## Introduction

### Data Collection Process and History

The MDA is required by state law to monitor pesticide use on a biennial basis. Minn. Stat. § 18B.064. In pursuit of fulfilling that responsibility, the MDA began exploring the possibility of using the existing framework of the NASS to enhance and broaden pesticide use monitoring efforts. NASS has a long history of providing statewide crop and production statistics. Over the last decade, NASS has also become an important information source for pesticide and fertilizer use. Several joint pilot projects evolved with the financial assistance from Environmental Protection Agency (EPA) and were conducted from 2001-2003. These pilots were essential to the final methodology used in this report.

The first pilot<sup>1</sup> was conducted in 2001 by expanding the existing Agricultural Resource Management Study (ARMS) developed by NASS. The normal number of participating Minnesota corn farms in an ARMS survey is about 150. The pilot increased the number of personal interviews to approximately 600 and most of the enhancements were focused on the southern third of the state. The pilot provided reliable regionally-enhanced data on pesticide product choices and application rates. Additionally, useful information on primary sources of pesticide management information, scouting, timing, and other pesticide management related information was obtained.

In neighboring North Dakota, the USDA, NASS, the North Dakota Field Office, and North Dakota State University Extension had already established a strong tradition in collecting statewide pesticide use by using NASS telephone enumerators. With the goal of expanding to a statewide scale while reducing costs, a second pilot<sup>2</sup> was developed. MDA and NASS used many techniques from the North Dakota program, but decided to expand the level of detail by including pesticide application rates. Historically, most mail or telephone style surveys have been unsuccessful at quantifying pesticide rates. Due to the numerous formulations, different application rates and units of measure (i.e. Active Ingredient [AI] can be expressed in pounds, ounces, pints or quarts), complications can quickly develop. Another major complicating factor may result due to the farmer using the services of a commercial pesticide applicator. If the farmer did not apply the product, the likelihood that the farmer would be familiar with the product and rate decreases significantly.

The second pilot survey was conducted in 2003 to test two methods of collecting pesticide rate information. “Method One” was conducted in Douglas County with 150 randomly selected farm operators. Operators were interviewed over the phone by the NASS enumerators. If the operator did not know the pesticides and/or rates, no additional follow-up work was conducted and the data was limited to information that was provided. “Method Two” was used in neighboring Grant County, where another 150 farm operators were contacted, and when farm records were incomplete, follow-up calls were made to the pesticide dealer to complete the survey. The number of surveys with complete data sets significantly increased with the additional assistance

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<sup>1</sup> “Expanded Minnesota Agricultural Statistics Pesticide Use Data”, 2003, by NASS and MDA.

<sup>2</sup> Unpublished data. From the September 20, 2003 EPA Report.

from the dealerships. Eighty-three percent of the surveys were complete in Grant County, where dealer follow-up calls were made, compared to forty-six percent in Douglas County. Equally impressive was the overall support by the local dealerships.

Subsequently, statewide surveys are conducted using “Method Two” from the pilot project conducted in Douglas and Grant Counties.

Farmers are interviewed over the phone in April and May. These are “cold calls,” meaning that the farmers did not get any type of notification about the survey prior to the contact. Consequently, all information collected using this approach is based upon either the participant’s memory or information readily available during the interview. The interviews typically last five to ten minutes.

Survey questions can be found in Appendix 1. Corresponding question numbers (noted as “Q” followed by the survey question number) are incorporated throughout the report and also in the table captions. The reader is encouraged to reference the survey to help interpret the results.

Questions are grouped into four categories including:

1. **General information.** Who applied the product, label and active ingredients, and record-keeping;
2. **Scouting for weeds and related practices.** Scouting, mapping, weed type, density, and herbicide resistant corn varieties;
3. **Water resources.** Physical distances from ground water, surface water and buffers, and irrigation management plans; and
4. **General practices.** Herbicide rotations and dealer involvement in herbicide management.

After obtaining some very general NASS information (Q.1), participants were then asked if they grew corn during the 2008 cropping season (Q.2). The interview process ended if they had not produced field or silage corn. Participants were then asked to identify the number of corn acres planted (Q.3). Table 1 includes the number of respondents and associated corn acres by county and Pesticide Monitoring Area. Also, included in Table 1 is the NASS total corn acres for Minnesota (2008) and the percentage of acres surveyed.

### **Data Reporting and Limitations**

The primary purpose of this survey was to obtain an understanding of basic herbicide management practices associated with corn production. Participants were asked to identify the herbicides used in very generic terms. Some knowledge of the herbicides used (i.e. soil applied, post-emergent, etc.) is essential to understand the current management strategies associated with them. It is important to note that the MDA and its partners provide a highly detailed herbicide use and application rate report on a biennial basis<sup>3</sup>.

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<sup>3</sup> “2007 Pesticide Usage on Four Major Minnesota Crops” found on the MDA website at: <http://www.mda.state.mn.us/news/publications/chemfert/2007pesticideuse.pdf>

Due to the simplified method used to collect what is typically considered complex data, it is imperative that the reader understand the limitations of the data sets. Many surveys conducted by NASS employ advanced sampling strategies which are designed to statistically represent a non-homogenous population, thus “weighting” the data to account for sample size, county size, and crop acreage, etc. Such strategies can be very expensive and are not without their own limitations.<sup>4</sup> This survey did not employ such strategies; rather, corn farmers were randomly selected from across Minnesota. Therefore, weighting across areas or counties was not performed. The MDA can be contacted to further discuss interpretation of the survey data.

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<sup>4</sup> For an explanation of survey methods and data quality associated with annual county-level data, visit the NASS “Quick Stats” Frequently Asked Questions website at: <http://www.nass.usda.gov/QuickStats/Screens/faqs.htm>



Table 1. Summary of respondents and corresponding corn acres by county and PMAs.

County	Pesticide Monitoring Area (PMA)	Number of Respondents	2008 Planted Corn Acres	Surveyed Corn Acres	Percentage of Acres Surveyed
Clay	1	13	94,000	3,541	4%
Grant	1	14	108,500	7,266	7%
Mahnomen	1	8	**	2,530	**
Marshall	1	6	**	1,015	**
Norman	1	7	77,500	1,166	2%
Red Lake	1	5	12,300	672	5%
Roseau	1	8	8,700	800	9%
Traverse	1	21	122,500	14,089	12%
Wilkin	1	5	78,000	3,955	5%
Others	1	7	**	1,033	**
<b>Totals/Averages</b>	<b>1</b>	<b>94</b>	<b>533,100</b>	<b>36,067</b>	<b>7%</b>
<b>Other PMAs (2,3)</b>	<b>2,3</b>	<b>14</b>	<b>**</b>	<b>1,068</b>	<b>**</b>
<b>Totals/Averages</b>	<b>2,3</b>	<b>14</b>	<b>**</b>	<b>1,068</b>	<b>**</b>
Becker	4	21	**	4,128	**
Benton	4	33	57,400	7,689	13%
Crow Wing	4	10	**	1,126	**
Douglas	4	27	57,600	3,555	6%
Kandiyohi	4	36	151,500	9,184	6%
Morrison	4	85	93,200	13,342	14%
Otter Tail	4	118	148,000	19,706	13%
Pope	4	31	94,600	8,259	9%
Sherburne	4	12	27,200	1,346	5%
Stearns	4	157	205,000	22,452	11%
Todd	4	68	68,700	5,338	8%
Wadena	4	23	22,000	2,068	9%
Others	4	2	**	184	**
<b>Totals/Averages</b>	<b>4</b>	<b>623</b>	<b>925,200</b>	<b>98,377</b>	<b>11%</b>
Chisago	5	11	26,300	1,495	6%
Isanti	5	13	31,400	2,401	8%
Kanabec	5	15	12,200	2,442	20%
Mille Lacs	5	22	19,800	3,393	17%
Others	5	12	**	1,577	**
<b>Totals/Averages</b>	<b>5</b>	<b>73</b>	<b>107,400</b>	<b>11,308</b>	<b>11%</b>
Big Stone	6	11	84,800	2,900	3%
Chippewa	6	37	147,500	16,112	11%
Lac Qui Parle	6	53	164,500	21,426	13%
Stevens	6	31	152,500	17,018	11%
Swift	6	32	172,500	14,783	9%
Yellow Medicine	6	48	188,000	19,031	10%
<b>Totals/Averages</b>	<b>6</b>	<b>212</b>	<b>90,9800</b>	<b>91,270</b>	<b>10%</b>

Table 1 (continued). Summary of respondents and corresponding corn acres by county and PMAs.

County	Pesticide Monitoring Area (PMA)	Number of Respondents	2008 Planted Corn Acres <sup>§</sup>	Surveyed Corn Acres	Percentage of Acres Surveyed
Lincoln	7	45	107,000	13,479	13%
Lyon	7	46	182,000	14,762	8%
Murray	7	51	182,500	12,529	7%
Nobles	7	57	207,500	16,275	8%
Pipestone	7	41	106,000	8,144	8%
Rock	7	49	100,500	16,461	16%
<b>Totals/Averages</b>	<b>7</b>	<b>289</b>	<b>885,500</b>	<b>81,650</b>	<b>10%</b>
Blue Earth	8	44	190,000	15,961	8%
Brown	8	61	154,000	11,699	8%
Cottonwood	8	55	187,500	20,417	11%
Faribault	8	42	204,500	18,607	9%
Freeborn	8	39	187,500	14,718	8%
Jackson	8	76	185,000	25,711	14%
Le Sueur	8	36	94,200	10,385	11%
Martin	8	50	236,500	20,778	9%
McLeod	8	52	108,500	10,345	10%
Meeker	8	43	113,500	15,289	13%
Nicollet	8	53	127,000	18,274	14%
Redwood	8	65	229,000	22,774	10%
Renville	8	79	274,000	28,725	10%
Rice	8	50	78,800	7,871	10%
Sibley	8	66	146,500	17,004	12%
Steele	8	25	111,500	8,165	7%
Waseca	8	41	128,000	11,346	9%
Watonwan	8	24	127,000	7,388	6%
Wright	8	44	71,600	9,232	13%
<b>Totals/Averages</b>	<b>8</b>	<b>945</b>	<b>2,954,600</b>	<b>294,689</b>	<b>10%</b>
Dodge	9	31	119,000	11,467	10%
Fillmore	9	72	165,500	15,163	9%
Goodhue	9	65	148,000	14,651	10%
Houston	9	47	56,500	5,719	10%
Mower	9	49	187,000	13,604	7%
Olmsted	9	40	114,500	9,818	9%
Wabasha	9	52	85,400	12,034	14%
Winona	9	56	80,800	7,162	9%
<b>Totals/Averages</b>	<b>9</b>	<b>412</b>	<b>956,700</b>	<b>89,618</b>	<b>9%</b>
Anoka	10	6	**	176	**
Carver	10	28	59,400	4,691	8%
Dakota	10	27	91,100	6,766	7%
Hennepin	10	6	15,400	519	3%
Scott	10	18	37,500	3,035	8%
Washington	10	14	16,300	1,795	11%
<b>Totals/Averages</b>	<b>10</b>	<b>99</b>	<b>21,9700</b>	<b>16,982</b>	<b>8%</b>
<b>State</b>	<b>All</b>	<b>2,765</b>	<b>7,700,000</b>	<b>722,007</b>	<b>9%</b>

<sup>§</sup> Note: USDA/NASS Minnesota Corn Acreage Planted

\*\* Not reported by NASS

## Statewide Herbicide Applications and Management on Corn

Ninety-four percent (94%) of the respondents reported using herbicides and those respondents managed 98% of the corn acres reported in this survey (Table 2). As previously stated, if herbicides were not used, the respondent's survey was then concluded.

Tables 3 through 30 contain information from all corn producers that used herbicides. Because, not all farmers answered every question, the sum of total acres and the sum of total respondents are sometimes less than the statewide averages.

Participants were then asked who made the application (Q. 4). Forty-eight (48%) of the respondents reported self applied, 42% of the respondents reported custom applied and 10% of the respondents reported both self applied and custom applied. Table 3 summarizes who applied the application and the responses are grouped by PMAs.

Farmers who applied their own herbicides averaged 328 acres of corn while farmers who had pesticides custom applied averaged 173 acres of corn. Farmers who both self applied and custom applied herbicides raised an average of 382 acres of corn.

**Table 2. Percentage of respondents that used corn herbicides.**

<b>Pesticide Monitoring Area</b>	<b>Do You Use Herbicides?</b>	<b>Percent of All Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>93</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>7</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>93</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>7</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>89</b>
<b>5 – East Central</b>	<b>No</b>	<b>11</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>94</b>
<b>6 – West Central</b>	<b>No</b>	<b>6</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>97</b>
<b>7 – Southwest</b>	<b>No</b>	<b>3</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>96</b>
<b>8 – South Central</b>	<b>No</b>	<b>4</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>94</b>
<b>9 – Southeast</b>	<b>No</b>	<b>6</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>86</b>
<b>10 – Metro</b>	<b>No</b>	<b>14</b>
<b>Statewide</b>	<b>Yes</b>	<b>94</b>
<b>Statewide</b>	<b>No</b>	<b>6</b>

**Table 3. “Did you: Apply herbicides yourself? Have herbicides custom applied? Both?” (Q.4)**

<b>Pesticide Monitoring Area</b>	<b>Application Type</b>	<b>Percent of Respondents</b>	<b>Average Corn Acres per Respondent</b>
1 – Northwest Red River	Self Applied	60	380
1 – Northwest Red River	Custom Applied	23	183
1 – Northwest Red River	Both	17	671
4 – Central Sands	Self Applied	44	207
4 – Central Sands	Custom Applied	51	124
4 – Central Sands	Both	5	224
5 – East Central	Self Applied	57	157
5 – East Central	Custom Applied	37	158
5 – East Central	Both	6	395
6 – West Central	Self Applied	55	536
6 – West Central	Custom Applied	31	234
6 – West Central	Both	15	519
7 – Southwest	Self Applied	56	297
7 – Southwest	Custom Applied	32	221
7 – Southwest	Both	12	428
8 – South Central	Self Applied	49	388
8 – South Central	Custom Applied	39	210
8 – South Central	Both	12	374
9 – Southeast	Self Applied	41	301
9 – Southeast	Custom Applied	52	154
9 – Southeast	Both	8	280
10 – Metro	Self Applied	43	246
10 – Metro	Custom Applied	51	131
10 – Metro	Both	7	126
Statewide	Self Applied	48	328
Statewide	Custom Applied	42	173
Statewide	Both	10	382

Farmers were asked, “Do you know the active ingredients (AI) of the herbicides you used in 2008?” (Q.5). Based upon previous surveys, most farmers identified the product name (i.e. “Roundup”, etc.), but identifying the AI (i.e. glyphosate) was considerably more challenging. Of all statewide respondents (self-applicators and those that hired a custom applicator), 68% stated they knew the A.I. in their herbicide applications and 5% stated they knew some of the AI (Table 4). Seventy-eight percent of the farmers that applied the products themselves<sup>5</sup> were able to

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<sup>5</sup> Farmers that applied pesticides themselves, referred to as “self-applicators,” includes farmers that self-apply and farmers that self-apply and custom apply (both), but not farmers who only had herbicides custom applied.

identify the AI. It must be emphasized that farmers were asked these questions “on the spot” and were not given the opportunity to check their records during the telephone interview.

**Table 4. “Do you know the active ingredients of the herbicides you used in 2008?” (Q.5)**

<b>Pesticide Monitoring Area</b>	<b>Knew the Active Ingredients</b>	<b>Percent of All Respondents</b>	<b>Percent of “Self-Applicators”</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>70</b>	<b>75</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>29</b>	<b>24</b>
<b>1 – Northwest Red River</b>	<b>Some</b>	<b>1</b>	<b>1</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>67</b>	<b>80</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>29</b>	<b>17</b>
<b>4 – Central Sands</b>	<b>Some</b>	<b>4</b>	<b>3</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>62</b>	<b>76</b>
<b>5 – East Central</b>	<b>No</b>	<b>32</b>	<b>15</b>
<b>5 – East Central</b>	<b>Some</b>	<b>6</b>	<b>10</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>76</b>	<b>86</b>
<b>6 – West Central</b>	<b>No</b>	<b>20</b>	<b>10</b>
<b>6 – West Central</b>	<b>Some</b>	<b>4</b>	<b>4</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>69</b>	<b>78</b>
<b>7 – Southwest</b>	<b>No</b>	<b>24</b>	<b>16</b>
<b>7 – Southwest</b>	<b>Some</b>	<b>6</b>	<b>6</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>68</b>	<b>76</b>
<b>8 – South Central</b>	<b>No</b>	<b>27</b>	<b>19</b>
<b>8 – South Central</b>	<b>Some</b>	<b>5</b>	<b>5</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>49</b>	<b>76</b>
<b>9 – Southeast</b>	<b>No</b>	<b>42</b>	<b>20</b>
<b>9 – Southeast</b>	<b>Some</b>	<b>8</b>	<b>4</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>63</b>	<b>71</b>
<b>10 – Metro</b>	<b>No</b>	<b>33</b>	<b>24</b>
<b>10 – Metro</b>	<b>Some</b>	<b>4</b>	<b>4</b>
<b>Statewide</b>	<b>Yes</b>	<b>68</b>	<b>78</b>
<b>Statewide</b>	<b>No</b>	<b>27</b>	<b>18</b>
<b>Statewide</b>	<b>Some</b>	<b>5</b>	<b>4</b>

\*Totals may not add due to rounding

Producers were asked if they kept pesticide application records on the farm (Q.6). Sixty-eight percent of all statewide respondents kept all their herbicide records on the farm and 4% kept some records on the farm (Table 5). Eighty-six percent of the farmers that applied their own herbicides kept records on the farm.

**Table 5. “Do you keep herbicide application records on your farm?” (Q.6)**

<b>Pesticide Monitoring Area</b>	<b>Kept “On Farm” Pesticide Records</b>	<b>Percent of All Respondents</b>	<b>Percent of Self-Applicators</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>76</b>	<b>85</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>20</b>	<b>11</b>
<b>1 – Northwest Red River</b>	<b>Some</b>	<b>5</b>	<b>5</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>61</b>	<b>81</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>35</b>	<b>14</b>
<b>4 – Central Sands</b>	<b>Some</b>	<b>3</b>	<b>4</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>69</b>	<b>88</b>
<b>5 – East Central</b>	<b>No</b>	<b>29</b>	<b>10</b>
<b>5 – East Central</b>	<b>Some</b>	<b>2</b>	<b>2</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>75</b>	<b>91</b>
<b>6 – West Central</b>	<b>No</b>	<b>21</b>	<b>6</b>
<b>6 – West Central</b>	<b>Some</b>	<b>4</b>	<b>4</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>71</b>	<b>83</b>
<b>7 – Southwest</b>	<b>No</b>	<b>25</b>	<b>13</b>
<b>7 – Southwest</b>	<b>Some</b>	<b>4</b>	<b>4</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>70</b>	<b>88</b>
<b>8 – South Central</b>	<b>No</b>	<b>26</b>	<b>9</b>
<b>8 – South Central</b>	<b>Some</b>	<b>3</b>	<b>3</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>62</b>	<b>86</b>
<b>9 – Southeast</b>	<b>No</b>	<b>34</b>	<b>11</b>
<b>9 – Southeast</b>	<b>Some</b>	<b>4</b>	<b>4</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>68</b>	<b>89</b>
<b>10 – Metro</b>	<b>No</b>	<b>29</b>	<b>9</b>
<b>10 - Metro</b>	<b>Some</b>	<b>3</b>	<b>2</b>
<b>Statewide</b>	<b>Yes</b>	<b>68</b>	<b>86</b>
<b>Statewide</b>	<b>No</b>	<b>29</b>	<b>11</b>
<b>Statewide</b>	<b>Some</b>	<b>4</b>	<b>4</b>

\*Totals may not add due to rounding

Participants were asked about the practice of reading the label (Q.7) and the results are provided in Table 6. Ninety-three percent of all statewide respondents who applied herbicide themselves usually read the label. This percentage drops to 71% for farmers who hired custom applicators.

**Table 6. “Do you usually read the label for pesticide products applied on your farm?” (Q.7)**

<b>Pesticide Management Area</b>	<b>Response to “Reading the Label”</b>	<b>Percent of All Respondents</b>	<b>Percent of Self-Applicators</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>83</b>	<b>91</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>17</b>	<b>9</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>64</b>	<b>94</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>36</b>	<b>6</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>68</b>	<b>90</b>
<b>5 – East Central</b>	<b>No</b>	<b>32</b>	<b>10</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>84</b>	<b>96</b>
<b>6 – West Central</b>	<b>No</b>	<b>16</b>	<b>4</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>77</b>	<b>94</b>
<b>7 – Southwest</b>	<b>No</b>	<b>23</b>	<b>6</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>73</b>	<b>94</b>
<b>8 – South Central</b>	<b>No</b>	<b>27</b>	<b>6</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>63</b>	<b>90</b>
<b>9 – Southeast</b>	<b>No</b>	<b>37</b>	<b>10</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>64</b>	<b>93</b>
<b>10 – Metro</b>	<b>No</b>	<b>36</b>	<b>7</b>
<b>Statewide</b>	<b>Yes</b>	<b>71</b>	<b>93</b>
<b>Statewide</b>	<b>No</b>	<b>29</b>	<b>7</b>

\*Totals may not add due to rounding

Participants were asked if they applied atrazine to their corn acres. A “Yes” response means they did use atrazine on at least **some** of their corn acres. A “No” response means they did not use atrazine on any of their corn acres. Table 7 details the responses to the question of whether atrazine was used and the percentage of farmers who knew if they applied atrazine (answered yes or no). Statewide, 20 percent of the respondents applied atrazine on some of their acres.

**Table 7. “Was Atrazine applied on any of your corn acres in 2008, premixes included?” (Q.8)**

<b>Pesticide Monitoring Area</b>	<b>Atrazine Applied</b>	<b>Percent of All Respondents</b>	<b>Percent of Respondents who Knew<sup>§</sup></b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>13</b>	<b>13</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>85</b>	<b>87</b>
<b>1 – Northwest Red River</b>	<b>Don’t Know</b>	<b>2</b>	
<b>4 – Central Sands</b>	<b>Yes</b>	<b>16</b>	<b>17</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>78</b>	<b>83</b>
<b>4 – Central Sands</b>	<b>Don’t Know</b>	<b>6</b>	
<b>5 – East Central</b>	<b>Yes</b>	<b>25</b>	<b>27</b>
<b>5 – East Central</b>	<b>No</b>	<b>66</b>	<b>73</b>
<b>5 – East Central</b>	<b>Don’t Know</b>	<b>9</b>	
<b>6 – West Central</b>	<b>Yes</b>	<b>13</b>	<b>13</b>
<b>6 – West Central</b>	<b>No</b>	<b>84</b>	<b>87</b>
<b>6 – West Central</b>	<b>Don’t Know</b>	<b>4</b>	
<b>7 – Southwest</b>	<b>Yes</b>	<b>15</b>	<b>16</b>
<b>7 – Southwest</b>	<b>No</b>	<b>79</b>	<b>84</b>
<b>7 – Southwest</b>	<b>Don’t Know</b>	<b>6</b>	
<b>8 – South Central</b>	<b>Yes</b>	<b>13</b>	<b>14</b>
<b>8 – South Central</b>	<b>No</b>	<b>83</b>	<b>86</b>
<b>8 – South Central</b>	<b>Don’t Know</b>	<b>3</b>	
<b>9 – Southeast</b>	<b>Yes</b>	<b>26</b>	<b>28</b>
<b>9 – Southeast</b>	<b>No</b>	<b>66</b>	<b>72</b>
<b>9 – Southeast</b>	<b>Don’t Know</b>	<b>8</b>	
<b>10 – Metro</b>	<b>Yes</b>	<b>21</b>	<b>23</b>
<b>10 – Metro</b>	<b>No</b>	<b>69</b>	<b>77</b>
<b>10 – Metro</b>	<b>Don’t Know</b>	<b>10</b>	
<b>Statewide</b>	<b>Yes</b>	<b>19</b>	<b>20</b>
<b>Statewide</b>	<b>No</b>	<b>76</b>	<b>80</b>
<b>Statewide</b>	<b>Don’t Know</b>	<b>5</b>	

<sup>§</sup> Percent was calculated using only those respondents who answered yes or no to the question.

\*Totals may not add due to rounding



Five percent (or 137 farmers) of the producers were not aware whether their herbicide package included atrazine (as an AI). Of this subgroup, 46% (or 63 farmers) knew the product(s) in their package. Of the farmers that knew the product name(s), it was determined that 48% (or 20 farmers) did apply a product within their herbicide package that contained atrazine.

Tables 8-9 pertain to the farmers applying atrazine. Included are those farmers who answered, “Yes”, to the question: “Was atrazine applied on any of your corn acres?” Farmers who answered, “I don’t know”, were included if they were later determined to have applied atrazine through identification of the product name. These farmers were classified through Q.8, Q.9, and Q.10.

**Table 8. “Was Atrazine incorporated on any of your corn acres in 2008, premixes included?” (Q.11)**

<b>Pesticide Monitoring Area</b>	<b>Was Atrazine Incorporated?</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>9</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>91</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>21</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>79</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>35</b>
<b>5 – East Central</b>	<b>No</b>	<b>65</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>27</b>
<b>6 – West Central</b>	<b>No</b>	<b>73</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>24</b>
<b>7 – Southwest</b>	<b>No</b>	<b>76</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>19</b>
<b>8 – South Central</b>	<b>No</b>	<b>81</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>25</b>
<b>9 – Southeast</b>	<b>No</b>	<b>75</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>16</b>
<b>10 – Metro</b>	<b>No</b>	<b>86</b>
<b>Statewide</b>	<b>Yes</b>	<b>22</b>
<b>Statewide</b>	<b>No</b>	<b>78</b>

\*Totals may not add due to rounding

Table 9. "Was Atrazine split applied on any of your corn acres in 2008, premixes included?" (Q.12)

Pesticide Monitoring Area	Was Atrazine Split Applied	Percent of Respondents
1 – Northwest Red River	Yes	0
1 – Northwest Red River	No	100
4 – Central Sands	Yes	4
4 – Central Sands	No	96
5 – East Central	Yes	0
5 – East Central	No	100
6 – West Central	Yes	11
6 – West Central	No	89
7 – Southwest	Yes	4
7 – Southwest	No	96
8 – South Central	Yes	5
8 – South Central	No	95
9 – Southeast	Yes	5
9 – Southeast	No	95
10 – Metro	Yes	0
10 – Metro	No	100
Statewide	Yes	4
Statewide	No	96

\*Totals may not add due to rounding

**Table 10. “Was Acetochlor applied on any of your corn acres in 2008, premixes included?” (Q.13)**

<b>Pesticide Monitoring Area</b>	<b>Acetochlor Applied</b>	<b>Percent of All Respondents</b>	<b>Percent of Respondents who Knew<sup>§</sup></b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>4</b>	<b>5</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>91</b>	<b>95</b>
<b>1 – Northwest Red River</b>	<b>Don't Know</b>	<b>5</b>	
<b>4 – Central Sands</b>	<b>Yes</b>	<b>9</b>	<b>10</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>80</b>	<b>90</b>
<b>4 – Central Sands</b>	<b>Don't Know</b>	<b>11</b>	
<b>5 – East Central</b>	<b>Yes</b>	<b>5</b>	<b>5</b>
<b>5 – East Central</b>	<b>No</b>	<b>82</b>	<b>95</b>
<b>5 – East Central</b>	<b>Don't Know</b>	<b>14</b>	
<b>6 – West Central</b>	<b>Yes</b>	<b>7</b>	<b>7</b>
<b>6 – West Central</b>	<b>No</b>	<b>84</b>	<b>93</b>
<b>6 – West Central</b>	<b>Don't Know</b>	<b>9</b>	
<b>7 – Southwest</b>	<b>Yes</b>	<b>9</b>	<b>10</b>
<b>7 – Southwest</b>	<b>No</b>	<b>80</b>	<b>90</b>
<b>7 – Southwest</b>	<b>Don't Know</b>	<b>11</b>	
<b>8 – South Central</b>	<b>Yes</b>	<b>12</b>	<b>14</b>
<b>8 – South Central</b>	<b>No</b>	<b>76</b>	<b>86</b>
<b>8 – South Central</b>	<b>Don't Know</b>	<b>12</b>	
<b>9 – Southeast</b>	<b>Yes</b>	<b>11</b>	<b>13</b>
<b>9 – Southeast</b>	<b>No</b>	<b>73</b>	<b>87</b>
<b>9 – Southeast</b>	<b>Don't Know</b>	<b>16</b>	
<b>10 – Metro</b>	<b>Yes</b>	<b>10</b>	<b>13</b>
<b>10 – Metro</b>	<b>No</b>	<b>69</b>	<b>87</b>
<b>10 – Metro</b>	<b>Don't Know</b>	<b>21</b>	
<b>Statewide</b>	<b>Yes</b>	<b>10</b>	<b>11</b>
<b>Statewide</b>	<b>No</b>	<b>78</b>	<b>89</b>
<b>Statewide</b>	<b>Don't Know</b>	<b>12</b>	

<sup>§</sup> Percent was calculated using only those respondents who answered yes or no to the question.

\*Totals may not add due to rounding

Editor’s Note. Twelve percent (or 311 farmers) of the producers were not aware if their herbicide package included acetochlor. Of this subgroup, 55% (or 171 farmers) identified the product name. Of the farmers that knew the product, 50% (or 85 farmers) did apply acetochlor. This was determined by providing the AIs in the products stated to have been applied by the farmers.

Tables 11-12 pertain to the farmers applying acetochlor. Included are those farmers who answered, “Yes”, to the question: “Was acetochlor applied on any of your corn acres?” Farmers who answered, “I don’t know”, were included when they were determined to have applied acetochlor through identification of the product name. These farmers were classified through Q.13, Q.14, and Q.15.

Due to the straight-forward nature of the remaining tables, only a minimal amount of supporting information was provided under the “Editor’s Notes”.

**Table 11. “Was Acetochlor incorporated on any of your corn acres in 2008, premixes included?” (Q.16)**

<b>Pesticide Monitoring Area</b>	<b>Was Acetochlor Incorporated?</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>75</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>25</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>26</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>74</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>0</b>
<b>5 – East Central</b>	<b>No</b>	<b>100</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>74</b>
<b>6 – West Central</b>	<b>No</b>	<b>26</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>70</b>
<b>7 – Southwest</b>	<b>No</b>	<b>30</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>57</b>
<b>8 – South Central</b>	<b>No</b>	<b>43</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>29</b>
<b>9 – Southeast</b>	<b>No</b>	<b>71</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>30</b>
<b>10 – Metro</b>	<b>No</b>	<b>70</b>
<b>Statewide</b>	<b>Yes</b>	<b>47</b>
<b>Statewide</b>	<b>No</b>	<b>53</b>

\*Totals may not add due to rounding

**Table 12. “Was Acetochlor split applied on any of your corn acres in 2008, premixes included?” (Q.17)**

<b>Pesticide Monitoring Area</b>	<b>Was Acetochlor Split Applied</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>0</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>100</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>1</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>99</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>0</b>
<b>5 – East Central</b>	<b>No</b>	<b>100</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>0</b>
<b>6 – West Central</b>	<b>No</b>	<b>100</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>1</b>
<b>7 – Southwest</b>	<b>No</b>	<b>99</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>2</b>
<b>8 – South Central</b>	<b>No</b>	<b>98</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>2</b>
<b>9 – Southeast</b>	<b>No</b>	<b>98</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>0</b>
<b>10 – Metro</b>	<b>No</b>	<b>100</b>
<b>Statewide</b>	<b>Yes</b>	<b>2</b>
<b>Statewide</b>	<b>No</b>	<b>98</b>

\*Totals may not add due to rounding

## Herbicide Program Decisions

Questions 18-21 were related to herbicide decisions. Only farmers who applied atrazine or acetochlor answered these questions. Of the 2,765 farmers surveyed, 706 (26 percent) applied either atrazine or acetochlor. The following questions were answered by those 706 farmers who applied atrazine or acetochlor.

**Table 13. “Who decides what products to apply?” (Q.18)**

<b>Pesticide Monitoring Area</b>	<b>Who Decides What Product to Apply?</b>	<b>Percent of All Respondents</b>
1 – Northwest Red River	Farmer	38
1 – Northwest Red River	Dealer/Consultant	15
1 – Northwest Red River	Both	46
4 – Central Sands	Farmer	33
4 – Central Sands	Dealer/Consultant	23
4 – Central Sands	Both	43
5 – East Central	Farmer	20
5 – East Central	Dealer/Consultant	25
5 – East Central	Both	55
6 – West Central	Farmer	39
6 – West Central	Dealer/Consultant	23
6 – West Central	Both	39
7 – Southwest	Farmer	42
7 – Southwest	Dealer/Consultant	16
7 – Southwest	Both	41
8 – South Central	Farmer	45
8 – South Central	Dealer/Consultant	14
8 – South Central	Both	41
9 – Southeast	Farmer	31
9 – Southeast	Dealer/Consultant	20
9 – Southeast	Both	48
10 – Metro	Farmer	23
10 – Metro	Dealer/Consultant	19
10 - Metro	Both	58
Statewide	Farmer	38
Statewide	Dealer/Consultant	18
Statewide	Both	44

\*Totals may not add due to rounding

**Table 14. “Who decides when to apply the herbicides?” (Q.19)**

<b>Pesticide Monitoring Area</b>	<b>Who Decides When to Apply Herbicides?</b>	<b>Percent of All Respondents</b>
1 – Northwest Red River	Farmer	57
1 – Northwest Red River	Dealer/Consultant	17
1 – Northwest Red River	Both	26
4 – Central Sands	Farmer	56
4 – Central Sands	Dealer/Consultant	23
4 – Central Sands	Both	21
5 – East Central	Farmer	55
5 – East Central	Dealer/Consultant	15
5 – East Central	Both	30
6 – West Central	Farmer	55
6 – West Central	Dealer/Consultant	20
6 – West Central	Both	25
7 – Southwest	Farmer	62
7 – Southwest	Dealer/Consultant	12
7 – Southwest	Both	26
8 – South Central	Farmer	61
8 – South Central	Dealer/Consultant	14
8 – South Central	Both	25
9 – Southeast	Farmer	51
9 – Southeast	Dealer/Consultant	18
9 – Southeast	Both	31
10 – Metro	Farmer	42
10 – Metro	Dealer/Consultant	23
10 – Metro	Both	35
Statewide	Farmer	57
Statewide	Dealer/Consultant	17
Statewide	Both	26

\*Totals may not add due to rounding

Table 15. "Who scouts your fields?" (Q.20)

Pesticide Monitoring Area	Who Scouts Your Fields?	Percent of All Respondents
1 – Northwest Red River	Farmer	54
1 – Northwest Red River	Dealer/Consultant	15
1 – Northwest Red River	Both	31
1 – Northwest Red River	Field Not Scouted	0
4 – Central Sands	Farmer	49
4 – Central Sands	Dealer/Consultant	30
4 – Central Sands	Both	20
4 – Central Sands	Field Not Scouted	1
5 – East Central	Farmer	55
5 – East Central	Dealer/Consultant	30
5 – East Central	Both	15
5 – East Central	Field Not Scouted	0
6 – West Central	Farmer	64
6 – West Central	Dealer/Consultant	23
6 – West Central	Both	14
6 – West Central	Field Not Scouted	0
7 – Southwest	Farmer	59
7 – Southwest	Dealer/Consultant	19
7 – Southwest	Both	21
7 – Southwest	Field Not Scouted	1
8 – South Central	Farmer	58
8 – South Central	Dealer/Consultant	20
8 – South Central	Both	20
8 – South Central	Field Not Scouted	2
9 – Southeast	Farmer	51
9 – Southeast	Dealer/Consultant	27
9 – Southeast	Both	21
9 – Southeast	Field Not Scouted	1
10 – Metro	Farmer	6
10 – Metro	Dealer/Consultant	41
10 – Metro	Both	53
10 – Metro	Field Not Scouted	0
Statewide	Farmer	55
Statewide	Dealer/Consultant	24
Statewide	Both	21
Statewide	Field Not Scouted	1

\*Totals may not add due to rounding



**Table 16. “Who determines if application setbacks or restrictions are appropriate on your farm?” (Q.21)**

<b>Pesticide Monitoring Area</b>	<b>Who Determines Setbacks?</b>	<b>Percent of All Respondents</b>
1 – Northwest Red River	Farmer	46
1 – Northwest Red River	Dealer/Consultant	31
1 – Northwest Red River	Both	23
1 – Northwest Red River	Neither	0
4 – Central Sands	Farmer	41
4 – Central Sands	Dealer/Consultant	34
4 – Central Sands	Both	22
4 – Central Sands	Neither	2
5 – East Central	Farmer	60
5 – East Central	Dealer/Consultant	35
5 – East Central	Both	5
5 – East Central	Neither	0
6 – West Central	Farmer	45
6 – West Central	Dealer/Consultant	30
6 – West Central	Both	25
6 – West Central	Neither	0
7 – Southwest	Farmer	59
7 – Southwest	Dealer/Consultant	19
7 – Southwest	Both	21
7 – Southwest	Neither	1
8 – South Central	Farmer	52
8 – South Central	Dealer/Consultant	24
8 – South Central	Both	22
8 – South Central	Neither	2
9 – Southeast	Farmer	47
9 – Southeast	Dealer/Consultant	28
9 – Southeast	Both	23
9 – Southeast	Neither	2
10 – Metro	Farmer	38
10 – Metro	Dealer/Consultant	27
10 – Metro	Both	35
10 – Metro	Neither	0
Statewide	Farmer	49
Statewide	Dealer/Consultant	27
Statewide	Both	22
Statewide	Neither	2

\*Totals may not add due to rounding

## Scouting for Weeds and Related Practices

Table 17. “Has someone mapped weed infestations in any of your fields in the last three years?” (Q.23)

Pesticide Monitoring Area	Weed Infestations Mapped Last 3 Years	Percent of Respondents
1 – Northwest Red River	Yes	0
1 – Northwest Red River	No	100
4 – Central Sands	Yes	21
4 – Central Sands	No	79
5 – East Central	Yes	0
5 – East Central	No	100
6 – West Central	Yes	7
6 – West Central	No	93
7 – Southwest	Yes	18
7 – Southwest	No	82
8 – South Central	Yes	17
8 – South Central	No	83
9 – Southeast	Yes	14
9 – Southeast	No	86
10 – Metro	Yes	15
10 - Metro	No	85
Statewide	Yes	16
Statewide	No	84

\*Totals may not add due to rounding

Table 18. “Do you choose herbicides based on type of weeds and/or density of weeds?” (Q.24)

<b>Pesticide Monitoring Area</b>	<b>Herbicide Choice Based on Weeds</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>77</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>23</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>92</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>8</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>80</b>
<b>5 – East Central</b>	<b>No</b>	<b>20</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>91</b>
<b>6 – West Central</b>	<b>No</b>	<b>9</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>90</b>
<b>7 – Southwest</b>	<b>No</b>	<b>10</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>93</b>
<b>8 – South Central</b>	<b>No</b>	<b>7</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>93</b>
<b>9 – Southeast</b>	<b>No</b>	<b>7</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>100</b>
<b>10 - Metro</b>	<b>No</b>	<b>0</b>
<b>Statewide</b>	<b>Yes</b>	<b>92</b>
<b>Statewide</b>	<b>No</b>	<b>8</b>

\*Totals may not add due to rounding

## Water Resources and Soil Resources

Table 19. “Do you know the soil texture of your farm?” (Q.25)

Pesticide Monitoring Area	Soil Texture Known of Farm Soils	Percent of Respondents
1 – Northwest Red River	Yes	69
1 – Northwest Red River	No	31
4 – Central Sands	Yes	93
4 – Central Sands	No	7
5 – East Central	Yes	70
5 – East Central	No	30
6 – West Central	Yes	86
6 – West Central	No	14
7 – Southwest	Yes	86
7 – Southwest	No	14
8 – South Central	Yes	85
8 – South Central	No	15
9 – Southeast	Yes	86
9 – Southeast	No	14
10 – Metro	Yes	96
10 - Metro	No	4
Statewide	Yes	87
Statewide	No	13

\*Totals may not add due to rounding

**Table 20. “Do you know the organic matter level of your farm soils?” (Q.26)**

<b>Pesticide Monitoring Area</b>	<b>Organic Matter Known of Farm Soils</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>62</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>38</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>62</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>38</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>40</b>
<b>5 – East Central</b>	<b>No</b>	<b>60</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>82</b>
<b>6 – West Central</b>	<b>No</b>	<b>18</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>74</b>
<b>7 – Southwest</b>	<b>No</b>	<b>26</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>78</b>
<b>8 – South Central</b>	<b>No</b>	<b>22</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>65</b>
<b>9 – Southeast</b>	<b>No</b>	<b>35</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>77</b>
<b>10 - Metro</b>	<b>No</b>	<b>23</b>
<b>Statewide</b>	<b>Yes</b>	<b>71</b>
<b>Statewide</b>	<b>No</b>	<b>29</b>

\*Totals may not add due to rounding

Table 21. “Do you know the depth to the water table in your field?” (Q.27)

<b>Pesticide Monitoring Area</b>	<b>Knowledge of Depth to the Water Table</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>46</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>54</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>43</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>57</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>40</b>
<b>5 – East Central</b>	<b>No</b>	<b>60</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>45</b>
<b>6 – West Central</b>	<b>No</b>	<b>55</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>34</b>
<b>7 – Southwest</b>	<b>No</b>	<b>66</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>40</b>
<b>8 – South Central</b>	<b>No</b>	<b>60</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>30</b>
<b>9 – Southeast</b>	<b>No</b>	<b>70</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>50</b>
<b>10 – Metro</b>	<b>No</b>	<b>50</b>
<b>Statewide</b>	<b>Yes</b>	<b>39</b>
<b>Statewide</b>	<b>No</b>	<b>61</b>

\*Totals may not add due to rounding

Editor’s Note: Respondents that answered, “No” were then asked whether they believed that the depth to groundwater exceeded 30 feet. Table 22 details those responses.

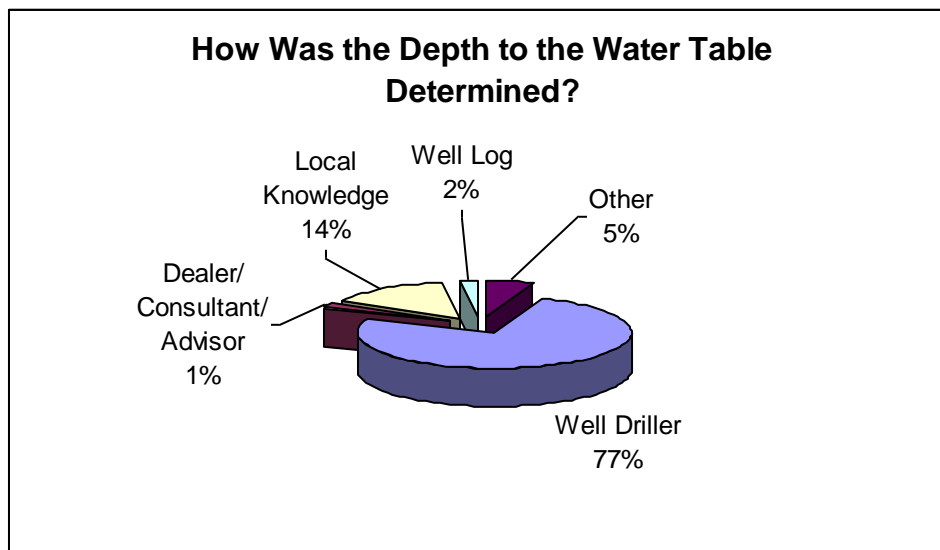
**Table 22. “Is the water table at a depth greater than 30 feet?” (Q.28)**

Pesticide Monitoring Area	“Yes” Response Percent of Respondents	“No” Response Percent of Respondents	Don’t Know Response Percent of Respondents
1 – Northwest Red River	54	15	31
4 – Central Sands	60	18	22
5 – East Central	50	30	20
6 – West Central	41	27	32
7 – Southwest	45	23	32
8 – South Central	40	28	32
9 – Southeast	55	22	33
10 – Metro	73	15	12
<b>Statewide</b>	<b>49</b>	<b>25</b>	<b>26</b>

\*Totals may not add due to rounding

Editor’s Note: Respondents who answered, “Yes”, to question 28 were then asked, “How was the depth primarily determined?” Figure 1 details their responses.

**Figure 1. Information sources used to determine water table depth (Q.28)**



**Table 23. “Are any streams, lakes, or other surface waters immediately adjacent to or in your corn fields?” (Q.29)**

<b>Pesticide Monitoring Area</b>	<b>Surface Water Adjacent to or in Field</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>38%</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>62%</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>28%</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>72%</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>40%</b>
<b>5 – East Central</b>	<b>No</b>	<b>60%</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>36%</b>
<b>6 – West Central</b>	<b>No</b>	<b>64%</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>33%</b>
<b>7 – Southwest</b>	<b>No</b>	<b>67%</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>47%</b>
<b>8 – South Central</b>	<b>No</b>	<b>53%</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>28%</b>
<b>9 – Southeast</b>	<b>No</b>	<b>72%</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>31%</b>
<b>10 - Metro</b>	<b>No</b>	<b>69%</b>
<b>Statewide</b>	<b>Yes</b>	<b>36%</b>
<b>Statewide</b>	<b>No</b>	<b>64%</b>

\*Totals may not add due to rounding



Editor’s Note: Respondents who answered, “Yes” to question 29 were then asked, “Are there filter strips or vegetative buffers on any of these acres?” Table 24 details their responses.

**Table 24. “Are there filter strips or vegetative buffers on any of these acres?” (Q.29.a)**

<b>Pesticide Monitoring Area</b>	<b>Filter Strips or Buffers</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>60</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>40</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>95</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>5</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>75</b>
<b>5 – East Central</b>	<b>No</b>	<b>25</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>88</b>
<b>6 – West Central</b>	<b>No</b>	<b>13</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>87</b>
<b>7 – Southwest</b>	<b>No</b>	<b>13</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>88</b>
<b>8 – South Central</b>	<b>No</b>	<b>12</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>95</b>
<b>9 – Southeast</b>	<b>No</b>	<b>5</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>100</b>
<b>10 - Metro</b>	<b>No</b>	<b>1</b>
<b>Statewide</b>	<b>Yes</b>	<b>89</b>
<b>Statewide</b>	<b>No</b>	<b>11</b>

\*Totals may not add due to rounding

Editor’s Note: Respondents who answered “Yes” to question 29a in regards to having filter strips or vegetative buffers were then asked, “Were they required as part of a conservation program?” Table 25 details their responses.

**Table 25. “Were they required as part of a conservation program?”(Q.29.a.i)**

<b>Pesticide Monitoring Area</b>	<b>Response</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>0</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>100</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>23</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>77</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>17</b>
<b>5 – East Central</b>	<b>No</b>	<b>83</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>7</b>
<b>6 – West Central</b>	<b>No</b>	<b>93</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>25</b>
<b>7 – Southwest</b>	<b>No</b>	<b>75</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>28</b>
<b>8 – South Central</b>	<b>No</b>	<b>72</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>47</b>
<b>9 – Southeast</b>	<b>No</b>	<b>53</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>13</b>
<b>10 - Metro</b>	<b>No</b>	<b>88</b>
<b>Statewide</b>	<b>Yes</b>	<b>28</b>
<b>Statewide</b>	<b>No</b>	<b>72</b>

\*Totals may not add due to rounding

**Table 26. “Do you irrigate corn?” (Q.30)**

<b>Pesticide Monitoring Area</b>	<b>Irrigation</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>8</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>92</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>18</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>82</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>5</b>
<b>5 – East Central</b>	<b>No</b>	<b>95</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>7</b>
<b>6 – West Central</b>	<b>No</b>	<b>93</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>1</b>
<b>7 – Southwest</b>	<b>No</b>	<b>99</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>2</b>
<b>8 – South Central</b>	<b>No</b>	<b>98</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>0</b>
<b>9 – Southeast</b>	<b>No</b>	<b>100</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>23</b>
<b>10 - Metro</b>	<b>No</b>	<b>77</b>
<b>Statewide</b>	<b>Yes</b>	<b>6</b>
<b>Statewide</b>	<b>No</b>	<b>94</b>

\*Totals may not add due to rounding

**Table 27. “Do you have an irrigation water management plan?” (Q.31)**

<b>Pesticide Monitoring Area</b>	<b>Irrigation Water Management Plan</b>	<b>Percent of Respondents</b>
<b>Statewide</b>	<b>Yes</b>	<b>74</b>
<b>Statewide</b>	<b>No</b>	<b>26</b>

\*Totals may not add due to rounding

Editor’s Note. Only six percent (or 42) of the farmers used irrigation on corn acres. Due to the small numbers of farmers irrigating, only statewide data is reported.

Figure 2. “What type of tillage did you use before planting on the majority of your corn aces?” (Q.32)

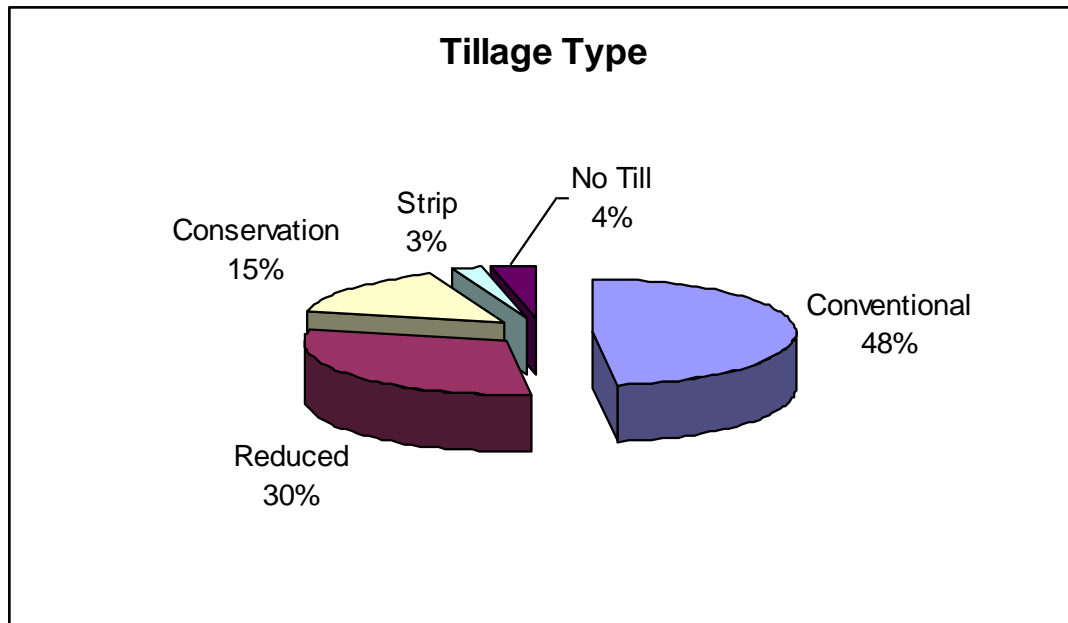


Table 28. “Do you use precision applications for herbicides (variable rate applications)?” (Q.33)

Pesticide Monitoring Area	Variable Rate Applications	Percent of Respondents
1 – Northwest Red River	Yes	15
1 – Northwest Red River	No	85
4 – Central Sands	Yes	37
4 – Central Sands	No	63
5 – East Central	Yes	40
5 – East Central	No	60
6 – West Central	Yes	24
6 – West Central	No	57
7 – Southwest	Yes	36
7 – Southwest	No	64
8 – South Central	Yes	33
8 – South Central	No	67
9 – Southeast	Yes	35
9 – Southeast	No	65
10 – Metro	Yes	27
10 - Metro	No	73
Statewide	Yes	34
Statewide	No	66

**Table 29. “In general, do you alternate use of herbicide products to keep weeds from becoming resistant to herbicides?” (Q.34)**

<b>Pesticide Monitoring Area</b>	<b>Response to Using Alternative Herbicide</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>85</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>15</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>85</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>15</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>90</b>
<b>5 – East Central</b>	<b>No</b>	<b>10</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>86</b>
<b>6 – West Central</b>	<b>No</b>	<b>14</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>92</b>
<b>7 – Southwest</b>	<b>No</b>	<b>8</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>89</b>
<b>8 – South Central</b>	<b>No</b>	<b>11</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>89</b>
<b>9 – Southeast</b>	<b>No</b>	<b>11</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>92</b>
<b>10 - Metro</b>	<b>No</b>	<b>8</b>
<b>Statewide</b>	<b>Yes</b>	<b>88</b>
<b>Statewide</b>	<b>No</b>	<b>12</b>

\*Totals may not add due to rounding

**Table 30. “Did you reduce from previous applications, the rate per acre of any corn herbicide?” (Q.35)**

<b>Pesticide Monitoring Area</b>	<b>Reduced Rate from Previous Applications</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>23</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>77</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>51</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>49</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>50</b>
<b>5 – East Central</b>	<b>No</b>	<b>50</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>55</b>
<b>6 – West Central</b>	<b>No</b>	<b>45</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>48</b>
<b>7 – Southwest</b>	<b>No</b>	<b>52</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>50</b>
<b>8 – South Central</b>	<b>No</b>	<b>50</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>50</b>
<b>9 – Southeast</b>	<b>No</b>	<b>50</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>62</b>
<b>10 - Metro</b>	<b>No</b>	<b>38</b>
<b>Statewide</b>	<b>Yes</b>	<b>50</b>
<b>Statewide</b>	<b>No</b>	<b>50</b>

\*Totals may not add due to rounding

**Table 31. “Did you select an herbicide with a different mode of action to reduce weed resistance to herbicides?” (Q.36)**

<b>Pesticide Monitoring Area</b>	<b>Selected Herbicide with Different Mode of Action to Reduce Weed Resistance</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>77</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>23</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>68</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>32</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>60</b>
<b>5 – East Central</b>	<b>No</b>	<b>40</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>80</b>
<b>6 – West Central</b>	<b>No</b>	<b>20</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>66</b>
<b>7 – Southwest</b>	<b>No</b>	<b>34</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>77</b>
<b>8 – South Central</b>	<b>No</b>	<b>23</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>79</b>
<b>9 – Southeast</b>	<b>No</b>	<b>21</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>62</b>
<b>10 - Metro</b>	<b>No</b>	<b>38</b>
<b>Statewide</b>	<b>Yes</b>	<b>74</b>
<b>Statewide</b>	<b>No</b>	<b>26</b>

\*Totals may not add due to rounding

**Table 32. “Did you choose a particular herbicide to reduce impacts to surface water or groundwater?” (Q.37)**

<b>Pesticide Monitoring Area</b>	<b>Chose Herbicide to Reduce Impact to Surface or Ground Water</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>31</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>69</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>45</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>55</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>40</b>
<b>5 – East Central</b>	<b>No</b>	<b>60</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>57</b>
<b>6 – West Central</b>	<b>No</b>	<b>43</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>47</b>
<b>7 – Southwest</b>	<b>No</b>	<b>53</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>53</b>
<b>8 – South Central</b>	<b>No</b>	<b>47</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>52</b>
<b>9 – Southeast</b>	<b>No</b>	<b>48</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>38</b>
<b>10 - Metro</b>	<b>No</b>	<b>62</b>
<b>Statewide</b>	<b>Yes</b>	<b>49</b>
<b>Statewide</b>	<b>No</b>	<b>51</b>

\*Totals may not add due to rounding



**Table 33. “Did you band herbicide applications to reduce use?” (Q.38)**

<b>Pesticide Monitoring Area</b>	<b>Banded Herbicide Applications to Reduce Use</b>	<b>Percent of Respondents</b>
<b>1 – Northwest Red River</b>	<b>Yes</b>	<b>0</b>
<b>1 – Northwest Red River</b>	<b>No</b>	<b>100</b>
<b>4 – Central Sands</b>	<b>Yes</b>	<b>10</b>
<b>4 – Central Sands</b>	<b>No</b>	<b>90</b>
<b>5 – East Central</b>	<b>Yes</b>	<b>5</b>
<b>5 – East Central</b>	<b>No</b>	<b>95</b>
<b>6 – West Central</b>	<b>Yes</b>	<b>7</b>
<b>6 – West Central</b>	<b>No</b>	<b>93</b>
<b>7 – Southwest</b>	<b>Yes</b>	<b>1</b>
<b>7 – Southwest</b>	<b>No</b>	<b>99</b>
<b>8 – South Central</b>	<b>Yes</b>	<b>9</b>
<b>8 – South Central</b>	<b>No</b>	<b>91</b>
<b>9 – Southeast</b>	<b>Yes</b>	<b>7</b>
<b>9 – Southeast</b>	<b>No</b>	<b>93</b>
<b>10 – Metro</b>	<b>Yes</b>	<b>0</b>
<b>10 - Metro</b>	<b>No</b>	<b>100</b>
<b>Statewide</b>	<b>Yes</b>	<b>7</b>
<b>Statewide</b>	<b>No</b>	<b>93</b>

\*Totals may not add due to rounding

## Appendix 1. Survey Form

P.O. Box 7068  
St. Paul, MN 55107-7068  
Telephone: 651-296-2230 or 1-800-453-7502  
FAX: 651-296-3185 or 1-800-839-2186

MINNESOTA  
AGRICULTURAL  
STATISTICS  
SERVICE

### Annual Pesticide Survey: Herbicide Applications and Practices on Corn in Planning for or During the 2008 Growing Season

Please make necessary corrections in name and address on the label.

#### **IDENTIFICATION (NASS use only)**

1. On land operated by the farm, ranch, or individual(s) listed on the label:

a. Were crops grown or hay cut at anytime during 2008?

YES  NO

b. Is any land in this operation in government programs such as CRP, WRP, etc?

YES  NO

c. Have or will grains or oilseeds be stored on this operation at anytime during 2004, or do you have storage facilities used for storing grain?

YES  NO

d. Have or will there be any hogs, cattle, sheep, horses, or other livestock, or poultry on this operation at anytime during 2008?

YES  NO

*If NO for all items, go to back page, Change in Operation*

Did you grow corn on your operation in 2008?

(Exclude sweet corn and popcorn)

YES  NO - conclude interview

3. How many corn acres were planted for field corn in 2008?

#### **GENERAL INFORMATION**

4. On your 2008 corn acres, did you:

Apply herbicides yourself? 1

Have herbicides custom applied? 2

Both? 3

Don't use herbicides [conclude interview] 4

Enter Code

5. Do you know the active ingredients of the herbicides you used on corn acres in 2008?

Yes = 1  No = 2  Some = 3

6. Do you keep herbicide application records on your farm?

Yes = 1  No = 2  Some = 3

7. Do you usually read the label for pesticide products applied on your farm?

Yes = 1  No = 2

**Atrazine specific questions**

8. Was Atrazine applied on any of your corn acres in 2008, premixes included?

Yes = 1 (go to 11)       No = 2 (go to 13)       Don't Know = 3

9. Do you know the products applied to your corn acres in 2008?

Yes = 1       No = 2 (go to 13)

10. Were any of the following products applied on your corn acres in 2008?

\*\*Computer list of products used

Yes = 1       No = 2 (go to 13)

11. Was Atrazine incorporated on any of your corn acres in 2008, premixes included?

Yes = 1       No = 2       I Don' Know = 4

12. Was Atrazine split-applied on any of your corn acres in 2008, premixes included?

Yes = 1       No = 2       I Don' Know = 4

**Acetochlor specific questions**

13. Was Acetochlor applied on any of your corn acres in 2008, premixes included?

Yes = 1 (go to 16)       No = 2 (go to 18)       Don't Know = 3

14. Do you know the products applied to your corn acres in 2008?

Yes = 1       No = 2 (go to 18)

15. Were any of the following products applied on your corn acres in 2008?

\*\*Computer list of products used

Yes = 1       No = 2 (go to 18)

16. Was Acetochlor incorporated on any of your corn acres in 2008, premixes included?

Yes = 1       No = 2       Don't Know = 3

17. Was Acetochlor split-applied on any of your corn acres in 2008, premixes included?

Yes = 1       No = 2       Don't Know = 3

**What Decisions do you and or your Fertilizer Dealer or Crop Consultant make in regard to your Herbicide program?**

18. Who decides what products to apply?

- I do (the farmer)? 1   
Dealer/Crop consultant? 2  Enter Code  
Both together? 3

19. Who decides when to apply the herbicides?

- I do (the farmer)? 1   
Dealer/Crop consultant? 2  Enter Code  
Both together? 3

20. Who scouts your fields?

- I do (the farmer)? 1   
Dealer/Crop consultant? 2  Enter Code  
Both together? 3   
Fields not Scouted? 4

21. Setbacks or restrictions are part of many pesticide labels. Who determines if applications setbacks or restrictions are appropriate on your farm?

- I do (the farmer)? 1   
Dealer/Crop consultant? 2  Enter Code  
Both together? 3   
Neither? 4

**SCOUTING FOR WEEDS and RELATED PRACTICES**

23. Has someone mapped weed infestations in any of your corn fields in the last three years?

- Yes = 1       No = 2

24. Do you choose herbicides based on type of weeds and/or density of weeds?

- Yes = 1       No = 2

**WATER RESOURCES and SOIL RESOURCES**

25. Do you know the soil texture of your farm?

Yes = 1       No = 2

26. Do you know the organic matter level of your farms soils?

Yes = 1       No = 2

27. Do you know the depth to the water table in your fields?

Yes = 1       No = 2

28. Is the water table at a depth greater than 30 feet?

Yes = 1       No = 2 (go to 29)       Don't know = 3 (go to 29)

If yes, how was the depth primarily determined? (check one)

Well driller for drinking water	}	1 <input type="checkbox"/>	<u>Enter Code</u>
Local knowledge		2 <input type="checkbox"/>	
A dealer, consultant or crop advisor		3 <input type="checkbox"/>	
Well log		4 <input type="checkbox"/>	
None of the above		5 <input type="checkbox"/>	

29. Are any streams, lakes or other surface waters immediately adjacent to or in your corn fields?

Yes = 1       No = 2      (if no go to 30)

29a. Are there filter strips or vegetative buffers on any of these acres?

Yes = 1       No = 2      (if no go to 30)

i. If YES, were they required as part of a conservation program?

Yes = 1       No = 2

30. Do you irrigate corn?

Yes = 1       No = 2 (if no go to 32)

If, yes,

31. Do you have an irrigation water management plan?

Yes = 1       No = 2

32. What type of tillage did you use before planting on the majority of your corn acres? (Fall and Spring)

- |                            |                            |                     |
|----------------------------|----------------------------|---------------------|
| Conventional < 15 residue  | 1 <input type="checkbox"/> | } <u>Enter Code</u> |
| Reduced Tillage 15 – 30?   | 2 <input type="checkbox"/> |                     |
| Conservation Tillage > 30? | 3 <input type="checkbox"/> |                     |
| Strip Tillage              | 4 <input type="checkbox"/> |                     |
| No Tillage                 | 5 <input type="checkbox"/> |                     |

**Now we are going to talk about GENERAL PRACTICES for corn acres only**

33. Do you use precision applications for herbicides (variable rate applications)?

- Yes = 1       No = 2

34. In general, do you alternate use of herbicide products to keep weeds from becoming resistant to herbicides?

- Yes = 1       No = 2

35. Did you reduce from previous applications, the rate per acre of any corn herbicide?

- Yes = 1       No = 2

36. Did you select an herbicide with a different mode of action to reduce weed resistance to herbicides?

- Yes = 1       No = 2

37. Did you choose a particular herbicide to reduce impacts to surface water or groundwater?

- Yes = 1       No = 2

38. Did you band herbicide applications to reduce use?

- Yes = 1       No = 2