

## **SURVEY OF WEED CONTROL AND PRODUCTION PRACTICES ON SUGARBEET IN MINNESOTA AND EASTERN NORTH DAKOTA IN 2012**

Aaron L. Carlson<sup>1</sup>, Jeff M. Stachler<sup>1</sup>, Mohamed F.R. Khan<sup>1</sup>, and Mark A. Boetel<sup>2</sup>

<sup>1</sup>Sugarbeet Research Specialist, Extension Sugarbeet Specialist, and Extension Sugarbeet Specialist  
North Dakota State University - University of Minnesota, Fargo, ND  
and

<sup>2</sup>Professor, Dept. of Entomology, North Dakota State University

The forty-fourth annual weed control and production practices questionnaire was performed electronically in 2012. The survey was linked to the websites of American Crystal Sugar Company, Minn-Dak Farmers Cooperative, and Southern Minnesota Beet Sugar Cooperative in September 2012. Growers were asked to evaluate weed control and sugarbeet injury from specific herbicides, and to list the most important weed and production problems related to sugarbeet grown in 2012. In addition, growers were asked to indicate herbicide use, insecticide use, fungicide use, sugarbeet acreage, acres of hand-weeded sugarbeet, pesticide application methods, cost of hand weeding sugarbeet and other questions relating to their 2012 sugarbeet crop. Insecticide use and fungicide use portions of the survey can be found in the Entomology and Plant Pathology sections of this book.

Sugarbeet growers planted 681,891 acres of sugarbeet in the Red River Valley and West Central Minnesota in 2012. One hundred fourteen growers responded to the survey in 2012, representing 69,662 acres or 10% of the total acres planted. Of the acres reported, 3% were conventional and 97% were Roundup Ready® (RR) sugarbeet. This is the greatest percentage of RR sugarbeet reported since they were first planted in 2008 and compares to 82% of reported acres being RR in 2011, 93% in 2010, 88% in 2009, and 49% in 2008. Only 8 and 1 survey respondents in Polk and Wilkin Counties, respectively, reported planting conventional sugarbeet in 2012 while respondents from all other counties planted only RR sugarbeet. This survey generated the fewest number of respondents in the history of this survey. This may be due to the use of an electronic format of the survey not being accessible or understandable to growers who traditionally completed the paper version of the survey. However, 82% of 2012 respondents preferred the electronic version to the paper versions of past years and the remaining 18% indicated no preference.

A summary of herbicide use, weed control, and crop injury averaged across all counties is presented in Table 1. The number of responses for an herbicide treatment is listed and the acres treated are expressed as a percentage of the total acreage reported. Multiple herbicide treatments are tabulated for each grower; therefore the number of responses for herbicide treatments exceeds the total number of survey respondents. Also, multiple herbicide treatments on the same acreage are listed separately in the tables, thus acres treated exceeds 100%. Weed control and sugarbeet injury are presented as the percentage of growers evaluating weed control or sugarbeet injury according to the categories listed. Table 2 and 3 provides a summary of herbicide use and performance in conventional sugarbeet and RR sugarbeet, respectively.

The herbicide trade names listed in the tables are original trade names. The original trade names also represent the generic formulations of the same active ingredient. Thus Nortron also represents Ethofumesate SC, Ethofumesate 42 SC, and Ethotron; Betamix also represents Phen-Des 8+8; Progress also represents BnB Plus; Stinger also represents Clean Slate, Clopyr Ag, Garrison, and Spur; Dual Magnum also represents Brawl and Charger Basic; Outlook also represents Commit, Establish, Propel, or Slider; Select also represents Select Max, Arrow, Clethodim 2EC, Intensity, Intensity One, Prism, Section, Shadow, Tapout, Trigger, and Volunteer; and Assure II also represents Targa.

Total sugarbeet acreage treated with herbicides in 2012 was 208% (Tables 1 and 4) compared to 287% in 2011, 256% in 2010, 230% in 2009, 308% in 2008, 383% in 2007, 386% in 2006, and 378% in 2005. The acres treated do not include "other weed control methods" which were non-herbicidal methods. Respondents planting conventional sugarbeet in 2012 applied herbicides to 378% of their acreage (Tables 2 and 4), compared to 403% in 2011, 385% in 2010, 299% in 2009, and 407% in 2008. Respondents who planted RR sugarbeet in 2012 applied herbicides to 202% of their acreage (Tables 3 and 4) compared to 262% in 2011, 245% in 2010, 225% in 2009, and 225% in 2008. This indicates that 2.02 herbicide applications were made to RR sugarbeet in 2012 which is the fewest applications to RR sugarbeet in the history of this survey. Possible reasons for reduced herbicide applications include early planting followed by early crop canopy closure which resulted in good weed control, environmental conditions that maximized herbicide activity for most herbicide applications, or the low number of survey respondents.

Nortron was the only soil-applied herbicide reported by respondents in 2012. Soil-applied herbicide use for all sugarbeet acreage was 2% in 2012 (Table 1), 6% in 2011, 2% in 2010, 5% in 2009, 20% in 2008, 25% in 2007, 23% in

2006, 24% in 2005, 4% in 2002, and 47% in 1989. Soil-applied herbicide use by respondents growing conventional sugarbeet was 42% in 2012 (Table 2), 27% in 2011, 4% in 2010, 18% in 2009, and 35% in 2008. Only 0.3% of RR sugarbeet acres received a soil-applied herbicide in 2012 (Table 3) compared to 1.4% in 2011, 0.2% in 2010, 0.4% in 2009, and 0% in 2008.

Postemergence (POST) herbicide use averaged across all sugarbeet fell to 201% in 2012 (Table 1) compared to 276% in 2011, 253% in 2010 and 224% in 2009, but still less than 279% in 2008, 340% in 2007, 335% in 2006, and 336% in 2005. Postemergence herbicide use in conventional sugarbeet also declined to 303% in 2012 (Table 2) compared to 362% in 2011, 378% in 2010, 259% in 2009 and 346% in 2008. Postemergence herbicide use by respondents planting RR sugarbeet declined to 198% in 2012 (Table 3) compared to 260% in 2011, 247% in 2010, 225% in 2009 and 223% in 2008. Sugarbeet were planted early in 2012 and the growing season afforded timely POST herbicide applications and rapid crop growth, thereby likely reducing the number of postemergence herbicide applications.

The most common herbicide treatment reported by all respondents since 2008 has been glyphosate applied POST. Glyphosate, when combined across all rates and combinations, was applied POST to 192% of the total sugarbeet acreage reported in 2012 (Table 1), compared to 198% in 2011, 224% in 2010, 190% in 2009 and 105% in 2008. Glyphosate, when combined across all rates and combinations, was applied to 198% of sugarbeet acreage reported by growers with RR sugarbeet in 2012 (Table 3), compared to 244% in 2011, 242% in 2010, 224% in 2009 and 223% in 2008. Glyphosate plus Stinger at 23% and glyphosate plus Select at 20% of acres treated were the most frequently reported herbicide combinations by respondents planting RR sugarbeet in 2012 (Table 3). Stinger has been reportedly applied to 12.2%, 8.4%, 2.7%, and 4.1% of RR sugarbeet acreage in 2011, 2010, 2009, and 2008, respectively. Stinger is likely added to glyphosate to help control volunteer RR soybean and/or glyphosate-resistant common ragweed, while Select is likely added to control volunteer RR corn.

The average cumulative rate of glyphosate reportedly applied POST per acre to 2012 RR sugarbeet was 2.32 pounds acid equivalent per acre (lb ae/A), compared 2.21 in 2011, 2.09 in 2010, 1.85 in 2009 and 1.95 lb ae/A in 2008. This increase may be due to the increased presence of glyphosate-resistant weeds, following recommendations from extension personnel and crop consultants, or the small sample size generated by this survey. In 2012 the average total rate of glyphosate applied per acre was calculated using actual product names and use rates provided by 80 of the 112 respondents who grew RR sugarbeet (data available upon request). In 2008 through 2011 the average total rate of glyphosate applied per acre was calculated by multiplying a glyphosate rate listed in Table 1 by the total percentage (in decimal form) of acres treated for that particular glyphosate rate listed in Table 1 and by the total acres reported in Table 1. The procedure was repeated for each glyphosate rate listed, the results were added, and then divided by the total RR sugarbeet acreage listed in Table 4. In 2012, Roundup PowerMax was applied most frequently by 59% of respondents reporting the use of glyphosate formulations (Table 5).

The use of POST grass herbicides (Select or Assure II in 2012) was 30% of all sugarbeet acres in 2012 (Table 1) as compared to 56% in 2011, 32% in 2010, 29% in 2009, 104% in 2008, 189% in 2007, 215% in 2006, and 203% in 2005. The rapid decline in postemergence grass herbicide usage after 2007 is due to the rapid adoption of RR sugarbeet. The usage of postemergence grass herbicides was 260% of conventional sugarbeet acreage only in 2012 (Table 2) and 2011, compared to 233% in 2010, 194% in 2009, and 220% in 2008. Select was used on 29% of all sugarbeet acres in 2012 (Table 1), compared to 53% in 2011, 15% in 2010, 26% in 2009, 92% in 2008, 167% in 2007, 199% in 2006, and 165% in 2005. Select was the only POST grass herbicide reportedly used by respondents planting conventional sugarbeet in 2012. Sixty-two percent of the POST grass herbicides used in conventional sugarbeet were applied in combination with the micro-rate or mid-rate herbicide treatments and included an oil adjuvant (Table 1). All POST grass herbicides used in RR sugarbeet were applied in combination with glyphosate.

The RR sugarbeet system continues to provide the most effective POST weed control reported by growers in the history of this survey. Sixty percent of RR sugarbeet respondents (Table 3) reported excellent POST weed control compared to 10% of respondents who grew conventional sugarbeet (Table 2). From 1974 to 2010, an average of 25% of conventional sugarbeet growers reported excellent weed control. Of growers who reported weed control from glyphosate applied alone (excludes those who did not respond), 77% reported excellent weed control in 2012 compared to 80% in 2011, 81% in 2010, 87% in 2009, and 92% in 2008 (data available upon request). This declining trend of excellent weed control should be noted, as it may indicate an increasing frequency of glyphosate-resistant weeds.

Glyphosate was applied preemergence to 1.0% of all reported sugarbeet acres in 2012 while Outlook was applied to 3.8% of all reported acres (Table 1). Preemergence glyphosate was applied only by respondents with conventional sugarbeet while Outlook was applied only by respondents with RR sugarbeet. A layby herbicide (Outlook, Dual, or

Treflan) application has been reportedly applied to 4.0%, 0%, 0.4%, 0%, and 1.9% of RR sugarbeet acreage in 2012, 2011, 2010, 2009, and 2008, respectively.

The rotary hoe was used on only 0.7% of all acres in 2012 (Table 1) compared to 0.9% in 2011, 2.8% in 2010, 2.4% in 2009, 15% in 2008, 25% in 2007, 41% in 2006, 56% in 2005, and 62% in 2000. A rotary hoe was used only by respondents with conventional sugarbeet in 2012. The rotary hoe and harrow have nearly vanished as a tool to control weeds in sugarbeet compared to historical use due to the introduction of RR sugarbeet. The electrical discharge system, weed pullers, mowing or swathing were not reported in 2012 compared to use on 0.1% of the total sugarbeet acreage in 2011, 0% in 2010, <1% in 2009, 0.4% in 2008, 2.6% in 2007, 1.7% in 2006, 1.9% in 2005, and 7.6% of the acreage in 1995.

Sugarbeet acreage operated by survey respondents in 2012 varied from less than 50 acres to greater than 2,000 acres (Table 6) with the median sugarbeet acreage being 438 acres and the average being 611 acres. The most common range in acres of sugarbeet was 400 to 599 acres with 17% of the respondents. Twenty percent of respondents reported producing 1,000 or more acres of sugarbeet in 2012.

Pigweed (33%), kochia (22%), common lambsquarters (22%), and foxtail (11%) were named as the “worst weed” problem by respondents planting conventional sugarbeet in 2012 (Table 7). Of the nine survey respondents planting conventional sugarbeet, one reported no problem as a “worst weed” problem in 2012 (Table 8).

‘None’ was reported most frequently as the “worst weed” problem by 28% of respondents planting RR sugarbeet in 2012 (Table 9). This was the fifth consecutive year that none was chosen most often by RR sugarbeet growers. Pigweed (20%), common lambsquarters (19%) and waterhemp (13%) were the next most reported “worst weed” problems by survey respondents planting RR sugarbeet in 2012 (Table 10). Waterhemp appears to be increasingly problematic for RR sugarbeet growers (Table 9), especially in Chippewa, Renville, and Traverse Counties (Table 10). The decline in lambsquarters as a “worst weed” problem in RR sugarbeet since 2009 is likely due to the reported increase in the cumulative glyphosate rate (Table 9 and text). Bolters, volunteer RR crops, and dandelion were listed as write in weed problems by respondents who planted RR sugarbeet in 2012.

Rhizoctonia/Aphanomyces was selected most often as the “most serious production problem” by survey respondents for the fourth year in a row with 43% of respondents (Table 11). From 1999 to 2008, weeds were the primary problem for respondents, but in 2012 only 11% of respondents selected weeds as their most serious production problem. This is the first rise of weeds as a serious production problem since the introduction of RR sugarbeet caused a decline in weeds as a serious production problem.

Weeds and Rhizoctonia were each selected by 33% of respondents growing conventional sugarbeet as the “most serious production problem” in 2012 (Table 12). Labor management, Cercospora leaf spot, and None were also selected by conventional sugarbeet growers in 2012.

Rhizoctonia was selected as the “most serious production problem” by 42% of respondents growing RR sugarbeet in 2012 (Table 13). “None” was the second “most serious production problem” reported by 11% of respondents. Weeds was named the “most serious production problem” by 9% of respondents planting RR sugarbeet in 2012 compared to 1%, 3%, 5%, and 26% of RR sugarbeet respondents in 2011, 2010, 2009, and 2008, respectively.

Twenty-two respondents (20%) planting RR sugarbeet from 8 counties suspected the presence of glyphosate-resistant weeds in sugarbeet in 2012 (Table 14). Waterhemp, common lambsquarters, and common ragweed were the most frequently listed weeds suspected of being glyphosate-resistant with 50%, 50%, and 23% of respondents in 2012, respectively. Only waterhemp, common ragweed, giant ragweed, and kochia have been confirmed glyphosate-resistant through greenhouse and/or field testing in Minnesota and/or North Dakota over the past 4 years. Common cocklebur, lambsquarters, Palmer amaranth, and redroot pigweed have not been confirmed glyphosate-resistant in Minnesota or North Dakota at this time. Respondents from Chippewa, Grand Forks, Renville, Traverse, and Wilkin Counties reported having suspected glyphosate-resistant waterhemp. Respondents from Polk and Wilkin Counties reported having suspected glyphosate-resistant common ragweed. Respondents from Chippewa and Traverse Counties reported having suspected glyphosate-resistant giant ragweed. This is the first year since 2009 that kochia was reported as a suspected glyphosate-resistant weed in sugarbeet and was reported by respondents from Traverse and Wilkin Counties. Respondents planting RR sugarbeet suspected glyphosate-resistant weeds on 10% of RR sugarbeet acres (Table 15). Respondents from Renville, Traverse, and Chippewa Counties suspected 43%, 29%, and 16% of sugarbeet acres, respectively, of having glyphosate-resistant weeds in 2012. Averaged over all responses, the density of glyphosate-resistant weeds was estimated to be about 1 weed per acre in 2012. At this density, hand-weeding is a very effective tool

to reducing the spread of suspected glyphosate-resistant weeds. Interestingly, 34% of reported RR sugarbeet acres were hand-weeded in Renville County in 2012, which was the greatest percentage of hand-weeded acres reported by any county. Averaged across all counties, respondents reported hand-weeding 5% of RR sugarbeet acres. Proper management of glyphosate in all RR crops is necessary to maintain long-term effectiveness of glyphosate in RR sugarbeet.

The percentage of all sugarbeet acreage hand-weeded was 62% in 1996, 23% in 2005, 28% in 2006 and 2007, 20% in 2008, 4% in 2009, 1% in 2010, 3% in 2011, and 6% in 2012 (data not shown). Twenty-three percent of reported conventional acres were hand-weeded in 2012 (data not shown), while 5% of reported RR sugarbeet acres were hand-weeded in 2012 (Table 15). Hand-weeded acres continue to stay low, most likely because most acreage is planted to RR sugarbeet and weed control from glyphosate is very good. Survey respondents from Renville (34%) and Chippewa (10%) Counties reported the greatest amount of hand-weeded acreage in 2012. Respondents from these two counties reported the first and third greatest acreage with suspected glyphosate-resistant weeds which may explain these levels of hand-labor.

The cost of hand-weeding ranged from zero to greater than \$80/A in 2012 (Table 16). The most common cost in 2012 was zero dollars as reported by 85% of survey respondents. Zero cost responses were 57% in 2005, 45% in 2006, 48% in 2007, 62% in 2008, 89% in 2009, 98% in 2010, and 92% in 2011. When averaged over all survey respondents, the average cost of hand-weeding as calculated from Table 16 was \$3.25/A in 2012 as compared to \$2.23/A in 2011, \$0.63/A in 2010, \$4.78/A in 2009, \$ 11.32/A in 2008, \$15.50/A in 2007, \$14.37/A in 2006, \$10.78/A in 2005, and \$34/A in 1995. The effectiveness of glyphosate and the percentage of acreage planted to RR sugarbeet have likely caused the reduction in the average cost of hand-weeding averaged over all respondents. When averaged across growers who actually reported hand-weeded acres, the average cost of hand weeding in 2012 was \$21.76/A compared to \$20.90/A in 2011, \$29.06/A in 2010, \$27.58/A in 2009, \$27.41/A in 2008, and \$29.40/A in 2007.

Averaged over all herbicides, herbicides were band-applied to only 3%, broadcast-applied with a ground sprayer to 95%, and broadcast-applied by air to 2% of total sugarbeet acreage in 2012 (Table 17). In 1998, herbicides were band-applied to 40% of the acreage, 37% in 2000, 38% in 2002, and 7% in 2009. Herbicides were applied by air to 17% of the acreage in 1998, 9% in 2000, 14% in 2002, and 1% in 2009. The introduction of RR sugarbeet has greatly reduced the amount of band- and aerial-applied herbicides.

Survey respondents planting conventional sugarbeets reported 119% of acreage as row crop cultivated in 2012 (Table 18), compared to 97% in 2011, and 74% in 2010. This is similar to the number of survey respondents reporting row crop cultivations for weed control in the past. In 2009, 100% of survey respondents planting conventional sugarbeet used row crop cultivation, compared to 95% in 2008 and 99% in 2007. Only 14% of RR sugarbeet acreage was reportedly row crop cultivated in 2012 compared to 10% in 2011, and 11% in 2010. In 2009, 28% of respondents used row crop cultivation for weed control in RR sugarbeet, compared to 32% in 2008. RR sugarbeet has reduced row crop cultivation for weed control compared to conventional sugarbeet.

Questions were asked about equipment for the first time in many years. The vast majority of respondents, 72%, reported John Deere as the primary tractor used in their farming operation in 2012 (Table 19). Case New Holland was the next most popular brand of tractor with 20% of survey respondents. Pembina was the only county with fewer respondents using John Deere tractors than another brand. Eighty percent of respondents indicated using a John Deere planter as their primary sugarbeet planter in 2012, while 18% reported using Monosem (Table 20). Amity, Wic, and Art's Way were the top three brands of sugarbeet harvesters used by 40%, 27%, and 20% of respondents, respectively, in 2012 (Table 21).

Respondents also were asked to rank topics for extension personnel to address at grower seminars or summer plot tours on a scale from 5 to 1 in order of importance, with 5 being most important and 1 being an area that should not be discussed. Disease management received the highest rating of 4.4, followed by identifying diseases at 4.2, and resistant weed management at 4.1 (Table 22). Grower input is greatly valued by extension personnel and sugarbeet growers' efforts to fill out this survey are much appreciated. Growers, thank you for your time in filling out this survey!

**TABLE 1. SUMMARY OF ALL HERBICIDES USED IN SUGARBEET REPORTED IN 2012. 114 GROWERS REPORTED ON 69,662 ACRES.**

Treatment	No. of Responses	Acres Treated	Acres % of Treated	% of Responses Reporting WEED CONTROL					% of Responses Reporting CROP INJURY				
				NR*	Exc	Gd	Fr	Pr	NR	None	Slt	Mod	Sev
<b>A. SOIL APPLIED HERBICIDES</b>													
Nortron PRE (Conv)	4	925	1.3	25	0	50	25	0	25	75	0	0	0
Nortron PRE (RR)	1	220	0.3	0	0	100	0	0	100	0	0	0	0
<b>Total-PPI &amp; PRE</b>	<b>5</b>	<b>1,145</b>	<b>1.6</b>	<b>20</b>	<b>0</b>	<b>40</b>	<b>40</b>	<b>0</b>	<b>20</b>	<b>80</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>B. POSTEMERGENCE HERBICIDES</b>													
Glyp	125	102,922	147.7	23	59	12	6	0	23	73	4	0	0
Glyp+Stinger	26	15,291	22.0	0	62	35	4	0	0	81	15	4	0
Glyp+Select	24	13,551	19.5	0	61	30	9	0	0	83	17	0	0
Bmix+UpB+Stg+Sel+Oil	4	1,880	2.7	0	0	50	50	0	0	50	50	0	0
Prog+UpBeet+Stg+Sel	1	1,539	2.2	0	0	100	0	0	0	100	0	0	0
Glyp+Stinger+Select	3	955	1.4	0	75	25	0	0	0	50	50	0	0
Glyp+Assure II	1	750	1.1	0	100	0	0	0	0	100	0	0	0
Prog+UpB+Stg+Sel+Oil	2	721	1.0	0	0	50	50	0	0	0	100	0	0
Prog+UpBeet+Stinger+Oil	2	496	0.7	0	50	50	0	0	0	0	50	50	0
Bnex+UpB+Stg+Sel+Oil	1	450	0.6	0	0	100	0	0	0	0	100	0	0
Bmix+UpBeet+Stinger+Oil	1	300	0.4	0	0	100	0	0	0	0	100	0	0
Bmix+UpBeet+Stg+Sel	2	250	0.4	0	50	50	0	0	0	50	50	0	0
Prog+UpB+Stg+Nrt+Sel+Oil	1	226	0.3	0	0	0	100	0	0	100	0	0	0
Bmix+UpB+Sel	1	225	0.3	0	0	100	0	0	0	0	100	0	0
Select+Oil	1	150	0.2	0	0	100	0	0	0	100	0	0	0
Prog+UpB+Sel+Oil	1	113	0.2	0	0	100	0	0	0	100	0	0	0
Bmix+UpBeet+Oil	1	85	0.1	0	0	0	100	0	0	0	100	0	0
Bmix+UpB+Sel+Oil	1	80	0.1	0	0	100	0	0	0	100	0	0	0
Bmix+UpB+Stg+Nort+Oil	1	80	0.1	0	0	100	0	0	0	100	0	0	0
Bmix+UpB+Stg+Nrt+Sel+Oil	1	80	0.1	0	0	100	0	0	0	100	0	0	0
<b>Total-POST</b>	<b>201</b>	<b>140,144</b>	<b>201.2</b>	<b>14</b>	<b>55</b>	<b>22</b>	<b>8</b>	<b>0</b>	<b>14</b>	<b>72</b>	<b>13</b>	<b>1</b>	<b>0</b>
<b>C. PREEMERGE &amp; LAY-BY HERBICIDES</b>													
Outlook	4	2,671	3.8	0	0	75	25	0	0	100	0	0	0
Glyp PRE	3	721	1.0	0	33	66	0	0	33	33	33	0	0
<b>Total-PRE&amp;Lay-by</b>	<b>7</b>	<b>3,392</b>	<b>4.9</b>	<b>0</b>	<b>14</b>	<b>71</b>	<b>14</b>	<b>0</b>	<b>14</b>	<b>71</b>	<b>14</b>	<b>0</b>	<b>0</b>
<b>D. OTHER WEED CONTROL METHODS</b>													
Cultivations (RR)	21	9,178	13.2	19	29	38	14	0	14	38	43	5	0
Cultivations (Conv)	8	2,627	3.8	0	38	50	12	0	0	75	25	0	0
Rotary Hoe (Conv)	1	513	0.7	0	0	100	0	0	0	100	0	0	0
<b>Total-Other Methods</b>	<b>30</b>	<b>12,318</b>	<b>17.7</b>	<b>13</b>	<b>30</b>	<b>43</b>	<b>13</b>	<b>0</b>	<b>10</b>	<b>50</b>	<b>37</b>	<b>3</b>	<b>0</b>
<b>TOTAL ALL TREATMENTS</b>	<b>243</b>	<b>156,999</b>	<b>225.4</b>	<b>14</b>	<b>49</b>	<b>27</b>	<b>10</b>	<b>0</b>	<b>14</b>	<b>69</b>	<b>16</b>	<b>1</b>	<b>0</b>

\*NR=No Response;Exc=Excellent;Gd=Good;Fr=Fair;Pr=Poor;Slt=Slight;Mod=Moderate;Sev=Severe

**TABLE 2. SUMMARY OF HERBICIDES USED IN CONVENTIONAL SUGARBEET IN 2012. 9 GROWERS REPORTED ON 2,202 ACRES.**

Treatment	No. of Responses	Acres Treated	Acres % of Total	% of Responses Reporting WEED CONTROL					% of Responses Reporting CROP INJURY				
				NR*	Exc	Gd	Fr	Pr	NR	None	Slt	Mod	Sev
<b>A. SOIL APPLIED HERBICIDES</b>													
Nortron PRE (Conv)	4	925	42.0	25	0	50	25	0	25	75	0	0	0
<b>Total-PPI &amp; PRE</b>	<b>4</b>	<b>925</b>	<b>42.0</b>	<b>25</b>	<b>0</b>	<b>50</b>	<b>25</b>	<b>0</b>	<b>25</b>	<b>75</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>B. POSTEMERGENCE HERBICIDES</b>													
Bmix+UpB+Stg+Sel+Oil	4	1,880	85.4	0	0	50	50	0	0	50	50	0	0
Prog+UpBeet+Stg+Sel	1	1,539	69.9	0	0	0	100	0	0	0	100	0	0
Prog+UpB+Stg+Sel+Oil	2	721	32.7	0	0	50	50	0	0	0	100	0	0
Prog+UpBeet+Stinger+Oil	2	496	22.5	0	50	50	0	0	0	0	50	50	0
Bnex+UpB+Stg+Sel+Oil	1	450	20.4	0	0	100	0	0	0	0	100	0	0
Bmix+UpBeet+Stinger+Oil	1	300	13.6	0	0	100	0	0	0	0	100	0	0
Bmix+UpBeet+Stg+Sel	2	250	11.4	0	50	50	0	0	0	50	50	0	0
Prog+UpB+Stg+Nrt+Sel+Oil	1	226	10.3	0	0	0	100	0	0	100	0	0	0
Bmix+UpB+Sel	1	225	10.2	0	0	100	0	0	0	0	100	0	0
Select+Oil	1	150	6.8	0	0	100	0	0	0	100	0	0	0
Prog+UpB+Sel+Oil	1	113	5.1	0	0	100	0	0	0	100	0	0	0
Bmix+UpBeet+Oil	1	85	3.9	0	0	0	100	0	0	0	100	0	0
Bmix+UpB+Sel+Oil	1	80	3.6	0	0	100	0	0	0	100	0	0	0
Bmix+UpB+Stg+Nort+Oil	1	80	3.6	0	0	100	0	0	0	100	0	0	0
Bmix+UpB+Stg+Nrt+Sel+Oil	1	80	3.6	0	0	100	0	0	0	100	0	0	0
<b>Total-POST</b>	<b>21</b>	<b>6,675</b>	<b>303.1</b>	<b>0</b>	<b>10</b>	<b>62</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>43</b>	<b>52</b>	<b>5</b>	<b>0</b>
<b>C. PREEMERGE &amp; LAY-BY HERBICIDES</b>													
Glyp PRE	3	721	32.7	0	33	66	0	0	33	33	33	0	0
<b>Total-PRE&amp;Lay-by</b>	<b>3</b>	<b>721</b>	<b>32.7</b>	<b>0</b>	<b>33</b>	<b>66</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>33</b>	<b>33</b>	<b>0</b>	<b>0</b>
<b>D. OTHER WEED CONTROL METHODS</b>													
Cultivations	8	2,627	119.3	0	38	50	12	0	0	75	25	0	0
Rotary Hoe	1	513	23.3	0	0	100	0	0	0	100	0	0	0
<b>Total-Other Methods</b>	<b>9</b>	<b>3,140</b>	<b>142.6</b>	<b>0</b>	<b>33</b>	<b>56</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>78</b>	<b>22</b>	<b>0</b>	<b>0</b>
<b>TOTAL ALL TREATMENTS</b>	<b>37</b>	<b>11,461</b>	<b>520.5</b>	<b>3</b>	<b>16</b>	<b>59</b>	<b>22</b>	<b>0</b>	<b>5</b>	<b>54</b>	<b>35</b>	<b>3</b>	<b>0</b>

\*NR=No Response;Exc=Excellent;Gd=Good;Fr=Fair;Pr=Poor;Slt=Slight;Mod=Moderate;Sev=Severe

**TABLE 3. SUMMARY OF HERBICIDES USED IN ROUNDUP READY SUGARBEET IN 2012. 112 GROWERS REPORTED ON 67,460 ACRES.**

Treatment	No. of Responses	Acres Treated	Acres % of Total	% of Responses Reporting WEED CONTROL					% of Responses Reporting CROP INJURY				
				NR*	Exc	Gd	Fr	Pr	NR	None	Slt	Mod	Sev
<b>A. SOIL APPLIED HERBICIDES</b>													
Nortron PRE (RR)	1	220	0.3	0	0	0	100	0	0	100	0	0	0
<b>Total-PPI &amp; PRE</b>	<b>1</b>	<b>220</b>	<b>0.3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>B. POSTEMERGENCE HERBICIDES</b>													
Glyp	125	102,922	152.6	23	59	12	6	0	23	73	4	0	0
Glyp+Stinger	26	15,291	22.7	0	62	35	4	0	0	81	15	4	0
Glyp+Select	24	13,551	20.1	0	61	30	9	0	0	83	17	0	0
Glyp+Assure II	1	750	1.1	0	100	0	0	0	0	100	0	0	0
Glyp+Stinger+Select	3	955	1.4	0	75	25	0	0	0	50	50	0	0
<b>Total-POST</b>	<b>180</b>	<b>133,469</b>	<b>197.8</b>	<b>16</b>	<b>60</b>	<b>18</b>	<b>6</b>	<b>0</b>	<b>16</b>	<b>75</b>	<b>8</b>	<b>1</b>	<b>0</b>
<b>C. PREEMERGE &amp; LAY-BY HERBICIDES</b>													
Outlook	4	2,671	4.0	0	0	75	25	0	0	100	0	0	0
<b>Total-PRE&amp;Lay-by</b>	<b>4</b>	<b>2,671</b>	<b>4.0</b>	<b>0</b>	<b>0</b>	<b>75</b>	<b>25</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>D. OTHER WEED CONTROL METHODS</b>													
Cultivations	21	9,178	13.6	19	29	38	14	0	14	38	43	5	0
<b>Total-Other Methods</b>	<b>21</b>	<b>9,178</b>	<b>13.6</b>	<b>19</b>	<b>29</b>	<b>38</b>	<b>14</b>	<b>0</b>	<b>14</b>	<b>38</b>	<b>43</b>	<b>5</b>	<b>0</b>
<b>TOTAL ALL TREATMENTS</b>	<b>206</b>	<b>145,538</b>	<b>215.7</b>	<b>16</b>	<b>55</b>	<b>21</b>	<b>8</b>	<b>0</b>	<b>16</b>	<b>72</b>	<b>12</b>	<b>1</b>	<b>0</b>

\*NR=No Response;Exc=Excellent;Gd=Good;Fr=Fair;Pr=Poor;Slt=Slight;Mod=Moderate;Sev=Severe

**Table 4. Acres of sugarbeet and percent of sugarbeet acres treated with herbicide by grower groups in 2012.**

Respondents who grew...	Respondents <sup>1</sup>	Acres	% of Acres treated with herbicide
RR Sugarbeet	112	67,460	202
Conventional Sugarbeet	9	2,202	378
All Sugarbeet	114	69,662	208

<sup>1</sup>Respondents = Of the 9 respondents who grew conventional sugarbeet, 2 grew only conventional beets while 7 grew both conventional and RR beets. Therefore 112 who grew RR + 2 who grew only conventional beets = 114 Total respondents

**Table 5. Glyphosate use rates per application, cumulative use rate, and product applied in RR sugarbeet by county in 2012.**

County	Resp.	lb ae/A per application				Cumulative glyphosate rate	Glyphosate Product Used <sup>7</sup>							Touchdown Total		
		<0.7	0.7 to 0.85	0.85 to 1.0	>1.0		P.Max	W.Max	Durango	Buc-aneer	Mad Dog	Corner-stone	Gly Star Plus		Makaze	
		-----% of responses-----					lb ae/A	-----% of responses-----								
Cass	6	0	50	33	17	2.30	100	0	0	0	0	0	0	0	0	0
Chippewa <sup>1</sup>	11	0	36	18	45	2.25	55	0	0	45	0	0	0	0	0	0
Clay <sup>2</sup>	14	0	0	71	29	2.32	36	0	50	0	0	0	0	0	0	14
Grand Forks	11	0	64	27	9	2.29	73	0	27	0	0	0	0	0	0	0
Kittson	9	44	44	11	0	1.71	44	0	22	0	0	33	0	0	0	0
Marshall	10	0	40	60	0	2.51	90	0	0	0	0	0	0	10	0	0
Norman <sup>3</sup>	5	0	40	0	60	2.63	80	0	20	0	0	0	0	0	0	0
Pembina	11	0	73	27	0	2.51	45	0	0	0	55	0	0	0	0	0
Polk	30	0	40	43	17	2.21	83	0	0	7	0	0	3	7	0	0
Renville <sup>4</sup>	24	4	46	29	21	2.19	21	54	0	25	0	0	0	0	0	0
Richland	4	0	0	100	0	3.49	100	0	0	0	0	0	0	0	0	0
Trails	5	20	20	0	60	2.82	40	0	0	40	0	20	0	0	0	0
Traverse <sup>5</sup>	6	0	0	33	67	2.52	0	50	33	0	0	0	17	0	0	0
Walsh	7	14	29	14	43	2.17	86	0	0	0	0	0	14	0	0	0
Wilkin <sup>6</sup>	24	4	71	17	8	2.47	67	13	17	4	0	0	0	0	0	0
<b>Total 177</b>	<b>5</b>	<b>42</b>	<b>33</b>	<b>20</b>	<b>2.32</b>	<b>59</b>	<b>11</b>	<b>11</b>	<b>9</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties

<sup>2</sup>Includes Becker County

<sup>3</sup>Includes Mahnommen County

<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties

<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties

<sup>6</sup>Includes Ottertail County

<sup>7</sup>P.Max=Roundup PowerMax; W.Max=Roundup WeatherMax; Bucaneer=Bucaneer, Bucaneer 5, Bucaneer Plus; Mad Dog=Mad Dog, Mad Dog Plus; Makaze=Makaze, Makaze Yield Pro

**Table 6. Total sugarbeet acreage operated by survey respondents in 2012.**

County	Respondents	Acres of sugarbeet										
		<50	50-99	100-199	200-299	300-399	400-599	600-799	800-999	1000-1499	1500-1999	2000+
		-----% of responses-----										
Cass	3	-	-	33	-	-	33	33	-	-	-	-
Chippewa <sup>1</sup>	4	-	25	25	25	-	-	-	-	-	25	-
Clay <sup>2</sup>	8	-	12	12	12	12	-	12	-	25	-	12
Grand Forks	6	-	17	33	17	-	-	17	-	17	-	-
Kittson	7	-	-	-	-	14	14	14	29	29	-	-
Marshall	6	-	17	-	-	-	17	33	-	17	-	17
Norman <sup>3</sup>	3	-	-	-	33	-	33	-	-	-	-	33
Pembina	9	-	-	11	22	22	22	-	11	-	-	11
Polk	27	-	-	7	11	11	19	30	7	11	4	-
Renville <sup>4</sup>	12	-	8	17	17	8	17	8	-	25	-	-
Richland	1	-	-	-	-	100	-	-	-	-	-	-
Trails	4	-	25	-	50	25	-	-	-	-	-	-
Traverse <sup>5</sup>	4	-	-	25	25	-	25	-	-	25	-	-
Walsh	6	17	-	-	33	17	17	-	-	17	-	-
Wilkin <sup>6</sup>	14	-	-	21	7	14	29	7	7	-	14	-
<b>Total</b>	<b>114</b>	<b>1</b>	<b>5</b>	<b>12</b>	<b>15</b>	<b>11</b>	<b>17</b>	<b>14</b>	<b>5</b>	<b>12</b>	<b>4</b>	<b>4</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties

<sup>2</sup>Includes Becker County

<sup>3</sup>Includes Mahnommen County

<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties

<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties

<sup>6</sup>Includes Ottertail County

**Table 7. A summary of the worst weed problem responses in conventional sugarbeet for the past 25 years.**

Year	PIWE <sup>1</sup>	FXTL <sup>1</sup>	COLQ <sup>1</sup>	WIOA <sup>1</sup>	WIBW <sup>1</sup>	WIMU <sup>1</sup>	KOCZ <sup>1</sup>	COCB <sup>1</sup>	SMWE <sup>1</sup>	EBNS <sup>1</sup>	COMA <sup>1</sup>	LASA <sup>1</sup>	VELE <sup>1</sup>	WAHE <sup>1</sup>	RAWE <sup>1</sup>
-----% of responses-----															
1989	54	5	4	1	5	<1	21	1	-	-	-	-	-	-	-
1990	51	2	8	1	5	0	23	1	3	-	-	-	-	-	-
1991	59	3	4	0	2	0	18	2	3	-	-	-	-	-	-
1992	47	4	8	3	4	<1	16	3	8	-	-	-	-	-	-
1993	38	3	6	6	8	1	13	3	9	3	2	-	-	-	-
1994	61	2	6	2	8	1	8	2	6	2	1	-	-	-	-
1995	71	2	4	1	2	1	4	1	8	4	1	-	-	-	-
1996	72	4	4	2	1	1	3	2	6	2	1	-	-	-	-
1997	53	7	4	2	6	1	3	2	5	4	1	-	-	-	-
1998	51	9	7	2	4	1	13	1	4	1	<1	-	-	-	-
1999	40	2	10	2	1	<1	33	1	3	1	<1	2	-	-	-
2000	18	2	19	<1	2	<1	43	2	3	<1	<1	2	-	1	-
2001	43	1	10	<1	1	0	32	1	4	4	<1	1	-	2	-
2002	44	<1	14	<1	<1	0	26	1	4	<1	<1	<1	2	5	-
2003	25	<1	18	<1	<1	0	46	<1	4	<1	<1	1	1	2	-
2004	21	<1	25	1	0	0	41	1	4	1	1	1	2	1	-
2005	42	<1	15	0	<1	0	29	2	4	<1	0	<1	1	1	-
2006	35	0	18	0	0	0	41	<1	3	0	0	0	1	<1	-
2007	34	<1	16	0	0	0	41	0	1	<1	<1	0	1	4	-
2008	24	0	19	0	0	0	33	5	10	2	0	0	0	0	-
2009	25	0	41	0	0	0	23	2	2	0	0	-	0	2	2
2010	31	0	21	0	0	0	38	0	0	-	3	-	0	0	0
2011	33	0	20	4	0	0	27	0	2	-	2	-	0	0	0
2012	33	11	22	0	0	0	22	0	0	-	0	-	0	0	0

<sup>1</sup>PIWE=pigweed species, FXTL=green & yellow foxtail, COLQ=common lambsquarters, WIOA=wild oat, WIBW=wild buckwheat, WIMU=wild mustard, KOCZ=kochia, COCB=common cocklebur, SMWE=smartweed, EBNS=eastern black nightshade, COMA=common mallow, LASA=lanceleaf sage, VELE=velevetleaf, WAHE=waterhemp, and RAWE=ragweed.

**Table 8. Worst weed problem in conventional sugarbeet by county in 2012.**

County	Responses	KOCZ <sup>6</sup>	COLQ <sup>6</sup>	PIWE <sup>6</sup>	FXTL <sup>6</sup>	BIWW <sup>6</sup>	SMWE <sup>6</sup>	WIOA <sup>6</sup>	YENU <sup>6</sup>	No Prob. <sup>6</sup>
-----% of responses-----										
Cass	0	-	-	-	-	-	-	-	-	-
Chippewa <sup>1</sup>	0	-	-	-	-	-	-	-	-	-
Clay <sup>2</sup>	0	-	-	-	-	-	-	-	-	-
Grand Forks	0	-	-	-	-	-	-	-	-	-
Kittson	0	-	-	-	-	-	-	-	-	-
Marshall	0	-	-	-	-	-	-	-	-	-
Norman <sup>3</sup>	0	-	-	-	-	-	-	-	-	-
Pembina	0	-	-	-	-	-	-	-	-	-
Polk	8	25	25	38	-	-	-	-	-	12
Renville <sup>4</sup>	0	-	-	-	-	-	-	-	-	-
Richland	0	-	-	-	-	-	-	-	-	-
Trails	0	-	-	-	-	-	-	-	-	-
Traverse <sup>5</sup>	0	-	-	-	-	-	-	-	-	-
Walsh	0	-	-	-	-	-	-	-	-	-
Wilkin <sup>6</sup>	1	-	-	-	100	-	-	-	-	-
<b>Total</b>	<b>9</b>	<b>22</b>	<b>22</b>	<b>33</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>

<sup>1</sup>Includes Becker County

<sup>2</sup>Includes Mahanomen County

<sup>3</sup>Includes Faribault, Redwood, and Sibley Counties

<sup>4</sup>Includes Grant, Swift, and Traverse Counties

<sup>5</sup>Includes Ottertail County

<sup>6</sup>KOCZ=kochia; COLQ=common lambsquarters; PIWE=pigweed species; FXTL=green and yellow foxtail; BIWW=biennial wormwood; SMWE=smartweed; WIOA=wild oat; YENU=yellow nutsedge; No Prob.=No problem.

**Table 9. A summary of the worst weed problem responses in RR sugarbeet for the past 5 years.**

Year	Response	None	COCB <sup>1</sup>	KOCZ <sup>1</sup>	COLQ <sup>1</sup>	FXTL <sup>1</sup>	PIWE <sup>1</sup>	RAWE <sup>1</sup>	SMWE <sup>1</sup>	VELF <sup>1</sup>	WIBW <sup>1</sup>	WIOA <sup>1</sup>	WAHE <sup>1</sup>	RR Crops <sup>1</sup>
-----% of responses-----														
2008	57	54	0	7	7	0	16	-	0	0	5	4	2	5
2009	178	39	2	3	30	0	12	2	1	1	2	2	3	2
2010	246	30	2	4	23	1	17	2	2	1	5	2	5	2
2011	205	29	1	4	16	2	20	7	1	0	3	2	11	3
2012	109	28	0	4	19	1	20	6	0	1	0	0	13	3

<sup>1</sup>COCB=common cocklebur; KOCZ=kochia; COLQ=common lambsquarters; FXTL=foxtail species; PIWE=pigweed species; RAWE=ragweed; SMWE=smartweed; VELF=velvetleaf; WIBW=wild buckwheat; WIOA=wild oat; WAHE=waterhemp; RR Crops=Roundup Ready crops.



**Table 10. Worst weed problem in RR sugarbeet by county in 2012.**

County	Responses	None	COCB <sup>1</sup>	KOCZ <sup>2</sup>	COLQ <sup>3</sup>	FXTL <sup>4</sup>	PIWE <sup>5</sup>	RAWE <sup>6</sup>	SMWE <sup>7</sup>	VELF <sup>8</sup>	WIBW <sup>9</sup>	WIOA <sup>10</sup>	WAHE <sup>11</sup>	Other <sup>12</sup>
-----% of responses-----														
Cass	3	67	-	-	-	-	33	-	-	-	-	-	-	-
Chippewa <sup>1</sup>	4	-	-	-	25	-	25	-	-	-	-	-	25	25
Clay <sup>2</sup>	8	25	-	13	13	-	-	25	-	-	-	-	-	25
Grand Forks	6	33	-	17	33	-	-	-	-	-	-	-	17	-
Kittson	6	50	-	-	17	-	33	-	-	-	-	-	-	-
Marshall	5	20	-	-	20	-	40	-	-	-	-	-	-	20
Norman <sup>3</sup>	3	33	-	-	66	-	-	-	-	-	-	-	-	-
Pembina	9	22	-	11	-	-	56	-	-	-	-	-	-	11
Polk	26	46	-	4	19	-	12	8	-	-	-	-	-	12
Renville <sup>4</sup>	12	8	-	-	-	-	8	-	-	8	-	-	75	-
Richland	1	-	-	-	-	-	100	-	-	-	-	-	-	-
Trails	3	67	-	-	33	-	-	-	-	-	-	-	-	-
Traverse <sup>5</sup>	4	-	-	-	25	-	-	25	-	-	-	-	50	-
Walsh	6	17	-	-	33	17	33	-	-	-	-	-	-	-
Wilkin <sup>6</sup>	13	15	-	-	30	-	30	15	-	-	-	-	8	-
<b>Total</b>	<b>109</b>	<b>28</b>	<b>0</b>	<b>4</b>	<b>19</b>	<b>1</b>	<b>20</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>9</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties<sup>2</sup>Includes Becker County<sup>3</sup>Includes Mahnomon County<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties<sup>6</sup>Includes Ottertail County<sup>7</sup>COCB=common cocklebur; KOCZ=kochia; COLQ=common lambsquarters; FXTL=foxtail species; PIWE=pigweed species; RAWE=ragweed; SMWE=smartweed; VELF=velvetleaf; WIBW=wild buckwheat; WIOA=wild oat; WAHE=waterhemp.<sup>8</sup>Other = bolters(4), RR canola(2), RR corn(1), dandelion (1)**Table 11. A summary of the most serious production problem responses for the past 25 years.**

Year	Production problem indicated as worst in sugarbeet									
	No Problem	Weeds	Weather	Emergence/ Stand	Labor mgmt.	Root maggot	Cercospora leaf spot	Rhizoctonia/ Aphanomyces	Rhizomania	Herbicide Injury
-----% of responses-----										
1988	1	37	12	40	1	1	1	-	-	-
1989	5	38	19	16	3	8	2	-	-	-
1990	5	42	20	10	2	8	4	-	-	-
1991	3	26	4	18	1	26	7	8	-	-
1992	11	45	9	15	5	9	1	3	-	-
1993	3	40	21	16	4	1	2	12	-	-
1994	3	56	12	13	4	1	3	8	-	-
1995	2	51	6	2	3	<1	24	11	-	-
1996	6	53	12	11	6	2	3	6	-	-
1997	15	34	13	12	3	1	5	14	2	-
1998	3	25	9	4	1	1	36	17	3	-
1999	14	39	14	12	2	1	6	9	2	-
2000	8	48	9	10	1	<1	3	18	2	-
2001	6	52	13	5	2	1	1	16	3	-
2002	4	53	11	19	1	<1	<1	9	3	-
2003	7	61	9	4	1	<1	1	11	2	4
2004	6	47	10	21	2	1	0	8	1	1
2005	3	36	22	3	3	0	0	22	11	0
2006	9	57	5	9	1	0	<1	13	3	1
2007	4	46	7	18	<1	<1	<1	18	2	1
2008	12	30	4	21	3	0	<1	24	2	1
2009	14	7	12	21	2	1	1	30	5	1
2010	14	6	8	5	2	1	3	53	5	1
2011	7	5	15	7	<1	1	1	54	3	<1
2012	11	11	7	8	3	0	7	43	1	0

**Table 12. Most serious production problem in conventional sugarbeet by county in 2012.**

County	Responses	No Problem	Rhizoctonia	Weeds	Labor Management	Cercospora
-----% of responses-----						
Polk	8	13	38	38	-	12
Wilkin <sup>1</sup>	1	-	-	-	100	-
<b>Total</b>	<b>9</b>	<b>11</b>	<b>33</b>	<b>33</b>	<b>11</b>	<b>11</b>

<sup>1</sup>Includes Ottertail County

**Table 13. Most serious production problem in RR sugarbeet by county in 2012.**

County	Responses	No Prob.	Emerg/Stand	Rhizo-mania	Aphan-omyces	Rhizoc-tonia	CLS <sup>7</sup>	Root Maggot	Weeds	Herbicide Injury	Labor Mangmt	Weather	Other <sup>8</sup>
-----% of responses-----													
Cass	3	33	-	-	-	67	-	-	-	-	-	-	-
Chippewa <sup>1</sup>	4	25	-	-	-	-	50	-	-	-	-	25	-
Clay <sup>2</sup>	8	-	38	-	-	38	-	-	-	-	-	13	13
Grand Forks	6	17	17	-	-	33	17	-	17	-	-	-	-
Kittson	6	17	-	-	-	83	-	-	-	-	-	-	-
Marshall	5	-	-	-	-	80	-	-	-	-	-	-	20
Norman <sup>3</sup>	3	33	-	-	-	33	-	-	-	-	-	33	-
Pembina	9	11	11	-	-	44	11	-	-	-	-	11	11
Polk	26	8	8	4	4	54	-	-	-	-	4	4	15
Renville <sup>4</sup>	12	17	-	-	8	33	-	-	42	-	-	-	-
Richland	1	-	-	-	-	-	-	-	100	-	-	-	-
Traill	3	-	-	-	-	33	-	-	-	-	-	67	-
Traverse <sup>5</sup>	4	25	-	-	-	-	25	-	50	-	-	-	-
Walsh	6	-	17	-	-	17	17	-	-	-	17	-	33
Wilkin <sup>6</sup>	13	8	15	-	8	38	8	-	8	-	-	8	8
<b>Total</b>	<b>109</b>	<b>11</b>	<b>9</b>	<b>1</b>	<b>3</b>	<b>42</b>	<b>6</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>2</b>	<b>7</b>	<b>9</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties

<sup>2</sup>Includes Becker County

<sup>3</sup>Includes Mahnomen County

<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties

<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties

<sup>6</sup>Includes Ottertail County

<sup>7</sup>CLS=Cercospora leaf spot

<sup>8</sup>Other = bolters (7); aphids (1); black cutworms (1); expensive leaches (1)

**Table 14. Weeds in RR sugarbeet suspected of being resistant to glyphosate in 2012.**

County	No. of Respondents	No. of sgbt fields	COCB <sup>5</sup>	KOCZ <sup>5</sup>	COLQ <sup>5</sup>	PAAM <sup>5</sup>	CORA <sup>5</sup>	GIRA <sup>5</sup>	RRPW <sup>5</sup>	WAHE <sup>5</sup>	Canola
-----% of respondents-----											
Chippewa <sup>1</sup>	3	3	0	0	33	0	0	33	0	100	0
Grand Forks	1	2	100	0	0	0	0	0	100	100	0
Marshall	1	1	0	0	0	0	0	0	0	0	100
Polk	5	21	0	0	40	0	80	0	0	0	0
Renville <sup>2</sup>	5	16	0	0	60	20	0	0	0	80	0
Traill	1	1	0	0	100	0	0	0	0	0	0
Traverse <sup>3</sup>	3	7	0	33	33	0	0	33	33	67	0
Wilkin <sup>4</sup>	3	8	0	33	100	0	33	0	0	33	0
<b>Total</b>	<b>22</b>	<b>59</b>	<b>5</b>	<b>9</b>	<b>50</b>	<b>5</b>	<b>23</b>	<b>9</b>	<b>9</b>	<b>50</b>	<b>5</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties

<sup>2</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties

<sup>3</sup>Includes Big Stone, Grant, Pope, and Stevens Counties

<sup>4</sup>Includes Ottertail County

<sup>5</sup>COCB=common cocklebur; KOCZ=kochia; COLQ=common lambsquarter; PAAM=Palmer amaranth; CORA=common ragweed; GIRA=giant ragweed; RRPW=redroot pigweed; WAHE=waterhemp

**Table 15. Roundup Ready sugarbeet acreage that was hand-weeded, sugarbeet acreage having suspected glyphosate-resistant weeds, and estimated densities of suspected glyphosate-resistant weeds in 2012.**

County	Respondent RR acres planted	Hand-weeded	Having suspected glyph.-resistant weeds	Density of suspected glyphosate-resistant weeds				
				1 per 40 acre	1 per 10 acre	1 per acre	1 per 1/4 acre	1 per area of a pickup
				-----% of RR acres planted-----				
Cass	1,323	0	0	-	-	-	-	-
Chippewa <sup>1</sup>	1,973	10	16	-	-	6	6	4
Clay <sup>2</sup>	7,147	0	0	-	-	-	-	-
Grand Forks	2,446	4	9	-	-	-	9	-
Kittson	5,436	0	0	-	-	-	-	-
Marshall	5,200	0	2	-	-	2	-	-
Norman <sup>3</sup>	3,775	0	0	-	-	-	-	-
Pembina	5,153	6	0	-	-	-	-	-
Polk	14,558	1	11	-	10	1	-	-
Renville <sup>4</sup>	6,323	34	43	3	-	17	23	-
Richland	368	0	0	-	-	-	-	-
Trail	896	0	11	-	11	-	-	-
Traverse <sup>5</sup>	2,241	0	29	13	-	5	-	10
Walsh	2,602	0	0	-	-	-	-	-
Wilkin <sup>6</sup>	8,019	6	11	2	-	-	-	9
<b>Total</b>	<b>67,460</b>	<b>5</b>	<b>10</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties

<sup>2</sup>Includes Becker County

<sup>3</sup>Includes Mahnomen County

<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties

<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties

<sup>6</sup>Includes Ottertail County

**Table 16. Cost of hand-weeding in all reported sugarbeet acreage in 2012.**

County	Respondents	Dollars per acre														
		0	1-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	80+
		-----% of respondents-----														
Cass	3	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chippewa <sup>1</sup>	4	50	-	-	25	25	-	-	-	-	-	-	-	-	-	
Clay <sup>2</sup>	8	100	-	-	-	-	-	-	-	-	-	-	-	-	-	
Grand Forks	6	83	-	-	-	-	17	-	-	-	-	-	-	-	-	
Kittson	7	100	-	-	-	-	-	-	-	-	-	-	-	-	-	
Marshall	6	100	-	-	-	-	-	-	-	-	-	-	-	-	-	
Norman <sup>3</sup>	3	100	-	-	-	-	-	-	-	-	-	-	-	-	-	
Pembina	9	89	11	-	-	-	-	-	-	-	-	-	-	-	-	
Polk	27	85	-	4	4	4	-	4	-	-	-	-	-	-	-	
Renville <sup>4</sup>	12	33	33	17	-	-	8	-	-	-	-	-	-	-	8	
Richland	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trail	4	100	-	-	-	-	-	-	-	-	-	-	-	-	-	
Traverse <sup>5</sup>	4	100	-	-	-	-	-	-	-	-	-	-	-	-	-	
Walsh	6	100	-	-	-	-	-	-	-	-	-	-	-	-	-	
Wilkin <sup>6</sup>	14	93	-	7	-	-	-	-	-	-	-	-	-	-	-	
<b>Total</b>	<b>114</b>	<b>85</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	

<sup>1</sup>Includes Kandiyohi and Swift Counties

<sup>2</sup>Includes Becker County

<sup>3</sup>Includes Mahnomen County

<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties

<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties

<sup>6</sup>Includes Ottertail County

**Table 17. Method of herbicide application across all reported sugarbeet acreage in 2012.**

Herbicide	Acres treated	Method of application		
		Band	Broadcast Ground	Broadcast Air
-----% of acres treated-----				
Glyphosate (PRE) Conv Beets	721	-	100	-
Nortron (PRE) Conv Beets	925	100	-	-
Nortron (PRE) RR Beets	220	-	100	-
Outlook (Lay-by) RR Beets	2,671	-	100	-
Grass+Oil	150	-	100	-
Bmix+UpBeet+Oil	85	-	100	-
Bmix+UpBeet+Grass	225	100	-	-
Bmix/Prog+UpBeet+Grass+Oil	193	59	41	-
Bmix/Prog+UpBeet+Stinger+Oil	796	38	34	28
Bmix/Prog+UpBeet+Stinger+Grass	1989	23	77	-
<b>Bnex/Bmix/Prog+UpBeet+Stinger+Grass+Oil</b>	<b>3051</b>	<b>44</b>	<b>56</b>	<b>-</b>
Bmix/Prog+UpBeet+Stinger+Nortron+Oil	80	-	100	-
Bmix/Prog+UpBeet+Stinger+Nortron+Grass+Oil	306	74	26	-
<b>Glyphosate (POST)</b>	<b>102,922</b>	<b>&lt;1</b>	<b>98</b>	<b>2</b>
Glyphosate+Stinger	15,291	-	100	-
Glyphosate+Grass	14,301	-	100	-
Glyphosate+Stinger+Grass	955	-	100	-
<b>Total</b>	<b>134,457</b>	<b>3</b>	<b>95</b>	<b>2</b>

**Table 18. Percent of acres planted that were cultivated to control weeds in 2012.**

County	Roundup Ready Sugarbeet				Conventional Sugarbeet			
	Number of Respondents	Acres Planted	Acres Cultivated	Acres Cultivated % of acres planted	Number of Respondents	Acres Planted	Acres Cultivated	Acres Cultivated % of acres planted
Cass	3	1,323	40	3	0	0	0	0
Chippewa <sup>1</sup>	4	1,973	1,774	90	0	0	0	0
Clay <sup>2</sup>	8	7,147	40	1	0	0	0	0
Grand Forks	6	2,446	210	9	0	0	0	0
Kittson	7	5,436	0	0	0	0	0	0
Marshall	6	5,200	0	0	0	0	0	0
Norman <sup>3</sup>	3	3,775	0	0	0	0	0	0
Pembina	9	5,153	0	0	0	0	0	0
Polk	26	14,558	785	5	8	2,102	2,627	125
Renville <sup>4</sup>	12	6,323	2,663	42	0	0	0	0
Richland	1	368	0	0	0	0	0	0
Trails	4	896	102	11	0	0	0	0
Traverse <sup>5</sup>	4	2,241	300	13	0	0	0	0
Walsh	6	2,602	724	28	0	0	0	0
Wilkin <sup>6</sup>	13	8,019	2,540	32	1	100	0	0
<b>Total</b>	<b>112</b>	<b>67,460</b>	<b>9,178</b>	<b>14</b>	<b>9</b>	<b>2,202</b>	<b>2,627</b>	<b>119</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties

<sup>2</sup>Includes Becker County

<sup>3</sup>Includes Mahanomen County

<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties

<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties

<sup>6</sup>Includes Ottertail County

**Table 19. Primary brand of tractor used by respondents in their farming operation in 2012.**

County	No. of Respondents	John Deere	CNH <sup>7</sup>	Caterpillar	Massy Ferguson	Other <sup>7</sup>
		-----% of respondents-----				
Cass	3	100	0	0	0	0
Chippewa <sup>1</sup>	3	100	0	0	0	0
Clay <sup>2</sup>	7	86	14	0	0	0
Grand Forks	4	100	0	0	0	0
Kittson	6	100	0	0	0	0
Marshall	5	80	0	20	0	0
Norman <sup>3</sup>	2	100	0	0	0	0
Pembina	8	38	50	0	0	13
Polk	24	79	8	4	4	4
Renville <sup>4</sup>	10	60	40	0	0	0
Richland	1	100	0	0	0	0
Trails	3	100	0	0	0	0
Traverse <sup>5</sup>	4	75	25	0	0	0
Walsh	4	50	50	0	0	0
Wilkin <sup>6</sup>	10	50	50	0	0	0
<b>Total</b>	<b>94</b>	<b>72</b>	<b>20</b>	<b>2</b>	<b>1</b>	<b>2</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties<sup>2</sup>Includes Becker County<sup>3</sup>Includes Mahnomen County<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties<sup>6</sup>Includes Ottertail County<sup>7</sup>CNH=Case New Holland; Other= AGCO(1), any brand (1)**Table 20. Primary brand of planter used by respondents for planting sugarbeet in 2012.**

County	No. of Respondents	John Deere	Monosem	Case IH	White
		-----% of respondents-----			
Cass	3	100	0	0	0
Chippewa <sup>1</sup>	3	100	0	0	0
Clay <sup>2</sup>	7	100	0	0	0
Grand Forks	4	75	25	0	0
Kittson	6	67	33	0	0
Marshall	5	100	0	0	0
Norman <sup>3</sup>	2	50	50	0	0
Pembina	8	75	25	0	0
Polk	24	79	21	0	0
Renville <sup>4</sup>	10	90	0	0	10
Richland	1	100	0	0	0
Trails	3	67	33	0	0
Traverse <sup>5</sup>	4	100	0	0	0
Walsh	4	25	75	0	0
Wilkin <sup>6</sup>	10	70	20	10	0
<b>Total</b>	<b>94</b>	<b>80</b>	<b>18</b>	<b>1</b>	<b>1</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties<sup>2</sup>Includes Becker County<sup>3</sup>Includes Mahnomen County<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties<sup>6</sup>Includes Ottertail County

**Table 21. Primary brand of harvester used by respondents for harvesting sugarbeet in 2012.**

County	No. of Responses	Red					
		Amity	Art's Way	River/Willrich	Wic	Parma	Alloway
-----% of responses-----							
Cass	3	100	0	0	0	0	0
Chippewa <sup>1</sup>	3	67	0	0	33	0	0
Clay <sup>2</sup>	7	29	29	14	29	0	0
Grand Forks	4	25	50	0	25	0	0
Kittson	6	17	67	0	17	0	0
Marshall	5	0	60	0	40	0	0
Norman <sup>3</sup>	3	33	0	0	33	0	33
Pembina	9	33	44	0	22	0	0
Polk	25	56	0	0	36	8	0
Renville <sup>4</sup>	10	50	20	0	30	0	0
Richland	1	0	0	100	0	0	0
Traill	3	67	0	0	0	33	0
Traverse <sup>5</sup>	4	25	0	0	75	0	0
Walsh	4	0	75	25	0	0	0
Wilkin <sup>6</sup>	11	36	18	36	9	0	0
<b>Total</b>	<b>98</b>	<b>40</b>	<b>22</b>	<b>7</b>	<b>27</b>	<b>3</b>	<b>1</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties

<sup>2</sup>Includes Becker County

<sup>3</sup>Includes Mahnomon County

<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties

<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties

<sup>6</sup>Includes Ottertail County

**Table 22. Topics of interest for sugarbeet seminars and research tours as ranked by respondents in 2012.**

County	Conventional	Resistant Weed	Disease	Identifying	Insect	Other <sup>7</sup>		
	Weed Control	Weed ID Management	Management	Diseases	Soil Fertility Management			
-----Ranking of importance (5=most emphasis; 3= keep it as it has been; 1=drop this area)-----								
Cass	2.5	3	3.5	3.5	3.5	3	-	
Chippewa <sup>1</sup>	2.7	3	4.7	4.7	4	3.3	-	
Clay <sup>2</sup>	1.8	3.4	3.8	4.5	4.8	3.4	3.5	4
Grand Forks	3	3.5	4.3	4	3.8	3.5	3.3	4
Kittson	1.8	2.6	4.3	4.7	4.2	3.8	3	-
Marshall	2.8	3.6	3.8	4.6	3.8	4.4	3.2	-
Norman <sup>3</sup>	3	3	3	4	4	4	4	4
Pembina	2.3	2.4	4	4.7	4.7	3.6	3.6	0
Polk	2.7	3.3	4.2	4.4	4.4	3.8	3.4	2
Renville <sup>4</sup>	3.1	3.7	4.2	4.6	4.3	4.4	3.6	0
Richland	2	5	5	5	5	4	3	-
Traill	3	3	5	4.5	5	4	4	-
Traverse <sup>5</sup>	3.3	3.3	4.5	4.3	4.3	4	2.8	-
Walsh	3	4	4.3	4.3	3.5	4.3	3.3	-
Wilkin <sup>6</sup>	2.4	3.1	3.9	4.3	4	3.5	3.2	5
<b>Average Rank</b>	<b>2.6</b>	<b>3.3</b>	<b>4.1</b>	<b>4.4</b>	<b>4.2</b>	<b>3.8</b>	<b>3.3</b>	<b>2.6</b>
<b>No. of Responses</b>	<b>80</b>	<b>80</b>	<b>86</b>	<b>89</b>	<b>86</b>	<b>85</b>	<b>83</b>	<b>11</b>

<sup>1</sup>Includes Kandiyohi and Swift Counties

<sup>2</sup>Includes Becker County

<sup>3</sup>Includes Mahnomon County

<sup>4</sup>Includes Faribault, Lac Qui Parle, McLeod, Redwood, Sibley, Stearns, and Yellow Medicine Counties

<sup>5</sup>Includes Big Stone, Grant, Pope, and Stevens Counties

<sup>6</sup>Includes Ottertail County

<sup>7</sup>Other includes: 1.Variable rate applications - fertilizer, seeding & other, imagery use, etc. - philosophy & discussion; 2.What topics are other areas of the world (ie Europe / UK) doing in terms of disease management, soil fertility and anything they do different than we do here in the red river valley; 3.Crop rotations - is a corn, beet, wheat rotation possibly better than wheat, beets, soy or edible bean rotation for beet disease?; 4.Info on other insects than sugarbeet root maggot; 5.Seedbed preparation, planting depth successes/problems in dry soil. Is 1.5 inches deep ok or not?; 6.Stressing more LibertyLink soybean in rotations; 7. Planting date, seed depth, population, cultivation, row marking, scalping, crown thickness.