

SURVEY OF FUNGICIDE USE IN SUGARBEET IN MINNESOTA AND EASTERN NORTH DAKOTA - 2007

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Sugarbeet growers were asked to report the fungicide used and the number of applications to sugarbeet acreage as part of the annual survey of sugarbeet growers. Multiple applications of fungicides to the same acreage were counted as multiple acres treated; thus, acres treated may exceed 100% of acres planted. All fungicides in [Table 1](#) would be used primarily for control of *Cercospora*.

Fungicide use in 2007, averaged over all counties, was 242% as compared to 208% in 2006, 206% in 2005 and 2004, 275% in 2003, 262% in 2002, and 248% in 2001 ([Table 1](#)). Acres not treated with fungicide were 1% in 2007, 2% in 2006, 6% in 2005, and less than 1% in 2004, 2003, 2002, and 2001. Fungicide usage in Chippewa County was 295% in 2007. Fungicide use was 852% in 1998, 599% in 1999, 409% in 2000, 299% in 2001, 304% in 2002, 295% in 2003, 291% in 2004, 296% in 2005, and 301% in 2006 in Chippewa County. Fungicide use was 702% in 1998, 625% in 1999, 430% in 2000, 308% in 2001, 297% in 2002, 308% in 2003, 305% in 2004, 304% in 2005, 335% in 2006, and 348% in 2007 in Renville County. Headline, Super/Agri Tin, and Eminent were the most commonly used fungicides and were used on 82%, 80%, and 72% of the acres, respectively. Super Tin was used on 3% of the acres in combination with other fungicides.

Eminent had a Section 18 label in 1999, 2000, 2001, 2002, 2003 and 2004 and was used on 165% of the acreage in 1999, 170% in 2000, 144% in 2001, 153% in 2002, 124% in 2003 and 99% in 2004. Eminent was fully labeled in 2005 and was used on 78% of the acreage in 2005, 60% in 2006, and 72% in 2007. Headline was fully labeled in 2002 and was used on 85% of the acreage in 2003, 52% in 2004, 72% in 2005, 84% in 2006, and 82% in 2007. Eminent and Headline use apparently had a large impact on *Cercospora* control. The percentage of respondents who named *Cercospora* as their worst production problem dropped from 36% in 1998 to 3% in 2000, <1% in 2002 and 2003, 0% in 2004 and 2005, and <1% in 2006 and 2007. Eminent and Headline are excellent fungicides, but they should be rotated with other fungicides to reduce the risk of *Cercospora* developing resistance to these chemistries.

The number of fungicide applications varied from zero to four times per respondent ([Table 2](#)). Ninety percent of the respondents applied fungicides two or three times. The average number of applications per grower was 2.6 in 2007, 2.2 in 2006 and 2005, 2.3 in 2004, 2.8 in 2003 and 2002, and 2.5 in 2001. The average number of applications per acre was 2.4 in 2007, 2.1 in 2006, 2005, and 2004, 2.8 in 2003, 2.6 in 2002, and 2.5 in 2001 ([Table 1](#)).

Averaged over fungicides and counties, 77% of the fungicides were applied with a ground sprayer and 23% with aerial application ([Table 3](#)). The usage of ground sprayers ranged from 43% in Walsh County to 97% in Clay County. The overall usage of ground sprayers was 63% in 2000, 60% in 2001, 67% in 2002, 79% in 2003, 73% in 2004, 79% in 2005, and 77% in 2006 and 2007.

The date of the first *Cercospora* spraying ranged from June 20 to after August 1 ([Table 4](#)). Southern areas generally were sprayed earlier than northern areas. Twenty-two percent of respondents began spraying

prior to July 11 in 2007 while 12% of respondents in 2006 and 2005, 20% in 2004, 33% in 2003, 29% in 2002, and 22% in 2001 began spraying for Cercospora prior to July 11.

The date of the last fungicide application ranged from before August 1 to after September 10 (Table 5). The last fungicide application was after August 20 by 79% of the respondents and after August 31 by 25% of the respondents. The last fungicide application was before August 11 by 6% of the respondents.

Cercospora leaf spot control was evaluated as excellent or good by 94% of the survey respondents averaged over all fungicides (Table 6). Comparisons among all fungicides are of questionable value since the number of responses varies so greatly from one fungicide to another. However, a large number of responses were received for Eminent, Headline, and Super Tin/Agri Tin. Excellent or good evaluations were received from 96% of the respondents for Eminent, 95% for Headline, and 91% for Super Tin/Agri Tin.

The reported acreages of sugarbeet that were affected by Rhizomania in 2007 are given in Table 7. Chippewa and Clay counties had the greatest percent of acres affected with Rhizomania. All other counties had less than 10 % of respondents acres reported as affected. All but one county, Grand Forks, reported some affected acres. Sixty-six percent of respondents' acres were seeded to Rhizomania-resistant varieties. The number of Rhizomania-resistant acres planted is expected to increase due to greater availability of resistant varieties with high yield and quality characteristics. The reported acreages of sugarbeet affected by Rhizoctonia, Aphanomyces, and Fusarium in 2007 are given in Table 7. These diseases continue to be a problem with 15% of reported acres affected by Rhizoctonia, 10% affected by Aphanomyces, and 2% affected by Fusarium. A need exists for varieties with improved disease resistance and for new tools to manage root diseases.

Table 1. Fungicide use for Cercospora control by survey respondents in 2007.

County	Repondent acres planted	Acres not treated	Fungicide treated acres											Total acres treated	
			Super/Agri tin	Eminent	Headline	Gem	Benlate	Topsin/ Topsin	Tin+	Mancozeb	Topsin+ Mancozeb	Tin+ Mancozeb	Enable		Other ⁷
			-----% of acres planted-----												
Cass	5,392	18	27	74	75	-	-	-	-	-	-	-	-	-	194
Chippewa ¹	8,860	-	101	82	76	14	-	2	2	-	-	9	9	-	295
Clay ²	9,007	-	42	93	93	-	-	-	-	-	-	-	-	-	228
Grand Forks	2,667	-	100	90	100	-	-	-	-	-	-	-	-	-	290
Kittson	4,661	-	14	67	87	-	-	-	-	-	-	-	-	-	168
Marshall	7,444	-	56	75	54	-	-	-	-	-	8	8	59	-	260
Norman ³	5,997	-	56	92	98	-	-	-	-	-	-	-	-	-	246
Pembina	8,603	-	9	76	85	-	-	-	-	-	-	-	-	-	170
Polk	26,572	-	66	93	88	6	-	6	<1	-	-	-	-	-	259
Renville ⁴	5,708	-	143	100	64	36	-	-	5	-	-	-	-	-	348
Richland	9,057	-	168	11	63	16	-	-	-	-	-	-	-	-	258
Trails	4,941	9	64	91	86	-	-	-	-	-	-	-	-	-	250
Traverse ⁵	3,966	-	151	-	108	-	-	-	-	-	-	-	-	-	259
Walsh	4,034	-	54	108	89	-	-	-	-	-	-	-	-	-	251
Wilkin ⁶	8,488	-	164	4	85	7	-	-	4	-	7	-	-	-	271
Total	115,397	1	80	72	82	6	0	2	1	0	1	1	5	242	

¹Includes Swift and Kandiyohi Counties

²Includes Becker County

³Includes Mahnomon County

⁴Includes Redwood, Faribault, Yellow Medicine, Lac Qui Parle, Sibley, and Stearns Counties

⁵Includes Grant, Stevens, and Big Stone Counties

⁶Includes Ottertail County

⁷Includes Headline+Supertin (1), and No Response (2)

Table 2. Number of fungicide applications by survey respondents in 2007.

County	Respondents	Number of Applications						
		0	1	2	3	4	5	>5
		-----% of respondents-----						
Cass	9	11	-	67	22	-	-	-
Chippewa ¹	21	-	-	5	62	33	-	-
Clay ²	17	-	-	53	47	-	-	-
Grand Forks	5	-	-	20	80	-	-	-
Kittson	7	-	14	86	-	-	-	-
Marshall	12	-	-	42	58	-	-	-
Norman ³	9	-	-	67	33	-	-	-
Pembina	12	-	17	83	-	-	-	-
Polk	42	-	-	29	71	-	-	-
Renville ⁴	18	-	-	-	61	39	-	-
Richland	15	-	-	47	53	-	-	-
Trails	11	9	-	27	64	-	-	-
Traverse ⁵	7	-	-	43	57	-	-	-
Walsh	10	-	-	60	40	-	-	-
Wilkin ⁶	15	-	-	20	73	7	-	-
Total	210	1	2	37	53	7	0	0

¹Includes Swift and Kandiyohi Counties²Includes Becker County³Includes Mahnomon County⁴Includes Redwood, Faribault, Yellow Medicine, Lac Qui Parle, Sibley, and Stearns Counties⁵Includes Grant, Stevens, and Big Stone Counties⁶Includes Ottertail County**Table 3. Ground and aerial application of fungicides in 2007.**

County	Treated Acres	Ground	Aerial
		-----% of treated acres-----	
Cass	9,517	88	12
Chippewa ¹	26,063	94	6
Clay ²	19,905	97	3
Grand Forks	7,649	49	51
Kittson	7,799	90	10
Marshall	19,216	62	38
Norman ³	14,722	78	22
Pembina	14,594	69	31
Polk	67,145	64	36
Renville ⁴	18,047	95	5
Richland	23,329	95	5
Trails	7,802	50	50
Traverse ⁵	10,264	85	15
Walsh	10,158	43	57
Wilkin ⁶	22,648	83	17
Total	278,858	77	23

¹Includes Swift and Kandiyohi Counties²Includes Becker County³Includes Mahnomon County⁴Includes Redwood, Faribault, Yellow Medicine, Lac Qui Parle, Sibley, and Stearns Counties⁵Includes Grant, Stevens, and Big Stone Counties⁶Includes Ottertail County

Table 4. Date of first fungicide application in 2007.

County	Number of Respondents	June 20-30	July 1-10	July 11-20	July 21-31	After Aug. 1
		-----% of respondents-----				
Cass	8	12	-	25	63	-
Chippewa ¹	21	-	76	24	-	-
Clay ²	16	-	6	38	25	31
Grand Forks	4	-	-	-	100	-
Kittson	6	-	16	17	17	50
Marshall	8	-	-	25	75	-
Norman ³	9	-	-	11	44	45
Pembina	11	-	-	27	46	27
Polk	40	-	10	15	45	30
Renville ⁴	17	6	82	12	-	-
Richland	14	-	7	21	50	22
Traill	8	-	-	-	88	12
Traverse ⁵	6	-	-	33	33	33
Walsh	10	-	10	-	60	30
Wilkin ⁶	12	-	8	25	67	-
Total	190	1	21	19	40	19

¹Includes Swift and Kandiyohi Counties²Includes Becker County³Includes Mahnommen County⁴Includes Redwood, Faribault, Yellow Medicine, Lac Qui Parle, Sibley, and Stearns Counties⁵Includes Grant, Stevens, and Big Stone Counties⁶Includes Ottertail County**Table 5. Date of last fungicide application in 2007.**

County	Number of Respondents	Before Aug. 1	Aug. 1-10	Aug. 11-20	Aug. 21-31	Sept. 1-10	After Sept. 10
		-----% of respondents-----					
Cass	7	-	-	-	86	14	-
Chippewa ¹	21	-	-	29	71	-	-
Clay ²	16	-	13	-	56	31	-
Grand Forks	5	-	-	-	40	60	-
Kittson	5	-	-	-	60	40	-
Marshall	10	-	-	10	50	40	-
Norman ³	9	-	-	45	11	33	11
Pembina	11	-	9	9	73	9	-
Polk	40	-	2	5	38	48	7
Renville ⁴	17	6	12	35	35	12	-
Richland	13	-	7	31	54	7	-
Traill	10	-	10	10	70	10	-
Traverse ⁵	6	-	16	17	50	17	-
Walsh	10	-	10	10	70	10	-
Wilkin ⁶	12	-	-	17	75	8	-
Total	192	1	5	15	54	23	2

¹Includes Swift and Kandiyohi Counties²Includes Becker County³Includes Mahnommen County⁴Includes Redwood, Faribault, Yellow Medicine, Lac Qui Parle, Sibley, and Stearns Counties⁵Includes Grant, Stevens, and Big Stone Counties⁶Includes Ottertail County

Table 6. Fungicide control of Cercospora leafspot in 2007.

Fungicide	Number of Respondents	Excellent	Good	Fair	Poor
		-----% of respondents-----			
Super Tin/Agri Tin	127	61	30	9	-
Enable	4	50	50	-	-
Mancozebs	4	50	-	50	-
Tin+Topsin	4	75	25	-	-
Tin+Mancozeb	2	100	-	-	-
Eminent	147	69	27	4	-
Gem	11	73	27	-	-
Headline	161	66	29	5	-
Other ¹	1	100	-	-	-
Total	461	66	28	6	0

¹Other=SuperTin+Headline

Table 7. Acres believed to be affected by Rhizomania, Aphanomyces, Rhizoctonia, and Fusarium in 2007.

County	Respondent acres planted	Acres seeded to Rhizomania resistant variety	Acres reported as affected by Rhizomania	Acres reported as affected by Aphanomyces	Acres reported as affected by Rhizoctonia	Acres reported as affected by Fusarium
		-----% of acres planted-----				
Cass	5,392	28	2	14	12	1
Chippewa ¹	8,860	81	32	18	16	<1
Clay ²	9,007	84	29	22	10	12
Grand Forks	2,667	44	-	4	15	-
Kittson	4,661	39	7	35	16	-
Marshall	7,444	68	1	13	7	-
Norman ³	5,997	91	1	6	15	<1
Pembina	8,603	45	1	12	9	2
Polk	26,572	80	8	13	11	3
Renville ⁴	5,708	52	6	15	12	-
Richland	9,057	66	6	19	4	3
Trail	4,941	31	-	2	2	-
Traverse ⁵	3,966	48	3	21	2	3
Walsh	4,034	75	4	13	23	2
Wilkin ⁶	8,488	75	-	14	3	1
Total	115,397	66	8	15	10	2

¹Includes Swift and Kandiyohi Counties

²Includes Becker County

³Includes Mahnomen County

⁴Includes Redwood, Faribault, Yellow Medicine, Lac Qui Parle, Sibley, and Stearns Counties

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