SURVEY OF FUNGICIDE USE IN SUGARBEET IN EASTERN NORTH DAKOTA AND MINNESOTA - 2006

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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 2006, averaged over all counties, was 208% as compared to 206% in 2005 and 2004, 275% in 2003, 262% in 2002, and 248% in 2001 (Table 1). Acres not treated with fungicide was 2% in 2006, 6% in 2005, and less than 1% in 2004, 2003, 2002, and 2001. Fungicide usage in Chippewa County was 301% in 2006. Fungicide use was 852% in 1998, 599% in 1999, 409% in 2000, 299% in 2001, 304% in 2002, 295% in 2003, 291% in 2004, and 296% in 2005 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, and 335% in 2006 in Renville County. Headline and Eminent were the most common fungicides and were used on 84% and 60% of the acres, respectively. Super Tin was used on 56% of the acres alone and on 3 to 4% of the acres in combination.

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 and 60% in 2006. Headline was fully labeled in 2003 and was used on 85% of the acreage in 2003, 52% in 2004, 72% in 2005, and 84% in 2006. 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.

Eminent and Headline are excellent fungicides, but they should be rotated with other fungicides to reduce the risk of Cercospora developing resistance. In 2006, out of the 291 survey respondents who used fungicides, one respondent used Gem and Headline (strobilurins) on the same acreage, one used Eminent twice, and 17 respondents used tin fungicides twice. This indicates that most sugarbeet growers are rotating fungicide modes of action for cercospora control.

The number of fungicide applications varied from zero to five times per acre (Table 2). Seventy-five percent of the respondents applied fungicides two or three times per acre. The average number of applications was 2.2 in 2006, 2.2 in 2005, 2.3 in 2004, 2.8 in 2003 and 2002, and 2.5 in 2001.

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 varied from 53% in Kittson County to 100% in Chippewa 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.

The date of the first Cercospora spraying ranged from June 20 to after August 1 (Table 4). The southern areas generally were sprayed earlier than more northern areas. In general, spraying started later in 2006 and 2005 with 12% of the respondents starting treatments prior to July 11, while 20% started prior to July 11 in 2004, 33% in 2003, 29% in 2002 and 22% in 2001.

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 74% of the respondents and after August 31 by 33% of the respondents. The last fungicide application was before August 11 by 11% of the respondents.

Cercospora leaf spot control was evaluated as excellent or good by 92% 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, 91% for Headline, and 89% for Super Tin/Agri Tin.

The reported acreages of sugarbeet that were affected by Rhizomania in 2006 are given in Table 7. Chippewa, Walsh, Polk, and Wilkin 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 two counties, Kittson and Pembina, reported some affected acres.

Table 1. Fungicide use for Cercospora control by survey respondents in 2006.

County	Respondent acres planted	Acres not treated	Super / Agri tin	Tin + Topsin	Topsin/ Benlate	Head-line	Man cozebs	Topsin+ Man cozeb	Tin+ Man cozeb	Eminent	GEM	Coppers	Other	Total acres treated
							% of acres planted							
Cass	7,920	<1	46	0	0	82	0	0	1	81	0	0	0	210
Chippewa[1]	8,599	0	105	0	0	77	0	0	0	100	19	0	0	301
Clay[2]	20,744	<1	4	0	0	81	0	0	0	95	0	0	0	180

Grand Forks	8,792	<1	51	0	0	83	0	0	0	54	0	0	0	188
Kittson	5,739	<1	48	0	0	81	0	0	0	33	14	5	0	181
Marshall	12,425	4	59	0	0	78	0	0	0	12	0	0	0	149
Norman[3]	10,069	3	41	0	0	88	0	0	0	48	0	0	0	177
Pembina	6,190	0	49	0	0	98	0	0	0	6	0	0	0	153
Polk	29,561	5	51	3	2	101	0	0	0	16	0	0	0	173
Renville[4]	14,970	0	134	2	0	84	0	0	<1	99	13	0	2	335
Richland	16,197	0	47	12	0	70	0	0	0	89	17	0	0	235
Traill	5,638	0	18	0	0	100	0	0	0	63	0	0	0	180
Traverse[5]	6,882	0	88	0	0	35	0	0	0	100	0	0	0	223
Walsh	10,118	0	43	4	0	79	0	0	0	36	0	0	0	163
Wilkin6	11,450	<1	68	14	0	89	0	0	0	85	3	0	0	260
Total	175,294	2	56	3	<1	84	0	0	<1	60	4	<1	<1	208

[1]Includes Swift and Kandiyohi Counties.
[2]Includes Becker County.
[3]Includes Mahnomen County.
[4]Includes Redwood, Faribault, Yellow Medicine, Lac Qui Parle, Sibley, and Stearns Counties.
[5]Includes Grant, Stevens, and Big Stone Counties.
[6]Includes Ottertail County.

Table 2. Number of fungicide applications by survey respondents in 2006.

		Number of applications						
County	Respondents	0	1	2	3	4	5	>5
			% of respondents					
Cass	16	0	0	63	37	0	0	0
Chippewa[1]	16	0	0	0	88	12	0	0
Clay[2]	22	0	9	77	14	0	0	0
Grand Forks	13	0	15	62	23	0	0	0
Kittson	10	0	30	60	0	10	0	0
Marshall	22	5	32	55	9	0	0	0
Norman3	17	6	18	65	12	0	0	0
Pembina	12	0	42	58	0	0	0	0

Polk	47	4	28	57	6	2	2	0
Renville4	29	0	0	3	45	52	0	0
Richland	22	0	5	45	50	0	0	0
Traill	10	0	20	70	10	0	0	0
Traverse5	12	0	8	50	42	0	0	0
Walsh	23	0	35	57	4	4	0	0
Wilkin6	20	0	5	25	70	0	0	0
Total	291	1	16	48	27	7	<1	0

[1]Includes Swift and Kandiyohi Counties.
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[6]Includes Ottertail County.

Table 3. Ground and aerial application of fungicides, 2006.

County	Ground	Aerial
	----------% of treated acres----------	
Cass	81	19
Chippewa1	100	0
Clay2	93	7
Grand Forks	64	36
Kittson	53	47
Marshall	73	27
Norman3	87	13
Pembina	44	56
Polk	60	40
Renville4	74	26
Richland	80	20
Traill	77	23
Traverse5	79	21
Walsh	73	27
Wilkin6	86	14
Total	77	23

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[6]Includes Ottertail County.

Table 4. Date of first fungicide application, 2006.

County	June 20-30	July 1-10	July 11-20	July 21-31	After Aug. 1
	% of respondents				
Cass	0	6	13	50	31
Chippewa[1]	0	36	50	14	0
Clay[2]	0	0	10	40	50
Grand Forks	0	0	0	27	73
Kittson	0	0	13	25	62
Marshall	0	0	0	15	85
Norman[3]	0	0	7	13	80
Pembina	0	0	9	18	73
Polk	0	0	5	5	90
Renville[4]	24	56	20	0	0
Richland	0	6	12	47	35
Traill	0	0	10	10	80
Traverse[5]	0	0	20	80	0
Walsh	5	0	5	21	68
Wilkin[6]	6	13	25	56	0
Total	3	9	12	24	51

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[5]Includes Grant, Stevens and Big Stone Counties.
[6]Includes Ottertail County.

Table 5. Date of last fungicide application, 2006.

County	Before Aug. 1	Aug. 1-10	Aug. 11-20	Aug. 21-31	Sept. 1-10	After Sept. 10
	% of respondents					
Cass	0	6	6	56	25	6
Chippewa[1]	0	8	59	25	8	0

Clay[2]	0	9	14	50	13	14
Grand Forks	0	0	18	36	46	0
Kittson	0	14	14	43	29	0
Marshall	0	0	12	47	35	6
Norman[3]	0	0	7	57	29	7
Pembina	0	18	9	46	27	0
Polk	0	7	8	44	38	3
Renville[4]	0	24	24	33	19	0
Richland	0	7	27	40	20	6
Traill	0	11	11	33	45	0
Traverse[5]	9	18	27	9	19	18
Walsh	13	0	0	50	37	0
Wilkin[6]	10	11	10	32	21	16
Total	2	9	15	41	28	5

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Table 6. Fungicide control of cercospora leafspot in 2006.

	Number of	Cercospora leafspot control rating			
Fungicide	Responses	Excellent	Good	Fair	Poor
		----------% of respondents----------			
Super Tin/Agri Tin	152	48	41	11	0
Coppers	0	0	0	0	0
Headline	213	58	33	9	0
Mancozebs	0	0	0	0	0
Topsin/Benlate	1	100	0	0	0
Tin + Topsin	7	43	57	0	0
Tin + Mancozeb	2	0	100	0	0
Topsin + Mancozeb	0	0	0	0	0
Eminent	152	72	24	4	0
GEM	12	75	25	0	0
Other	2	50	50	0	0

Total	541	59	33	8	0

Table 7. Acres affected by Rhizomania, 2006.

County	Respondent acres planted	Acres reported as affected by Rhizomania	Acres seeded to Rhizomania Resistant Variety
		----------% of acres planted----------	
Cass	7,920	1	32
Chippewa[1]	8,599	18	70
Clay[2]	20,744	8	84
Grand Forks	8,792	1	50
Kittson	5,739	0	61
Marshall	12,425	<1	58
Norman[3]	10,069	6	72
Pembina	6,190	0	74
Polk	29,561	13	82
Renville[4]	14,970	2	76
Richland	16,197	6	46
Traill	5,638	8	71
Traverse[5]	6,882	<1	34
Walsh	10,118	17	75
Wilkin[6]	11,450	11	43
Total	175,294	7	65

[1]Includes Swift and Kandiyohi Counties.
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