

## TURNING POINT SURVEY OF FUNGICIDE USE IN SUGARBEET IN MINNESOTA AND EASTERN NORTH DAKOTA IN 2022

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The eighth annual fungicide practices live polling questionnaire was conducted using Turning Point Technology at the 2023 Winter Sugarbeet Growers' Seminars held during January and February 2023. Responses are based on production practices from the 2022 growing season. The survey focuses on responses from growers in attendance at the Fargo, Grafton, Grand Forks, Wahpeton, ND and Willmar, MN Grower Seminars. Respondents from each seminar indicated the county in which the majority of their sugarbeets were produced (Table 1-4). The average sugarbeet acreage per respondent grown in 2022 was calculated from Table 5 at between 400 and 599 acres.

Survey respondents were asked about soilborne disease and control practices. Fifty-seven percent said their fields were affected by Rhizoctonia, 13% said Aphanomyces was the biggest issue, twelve percent said they had issues with multiple disease including Rhizoctonia, Aphanomyces, Fusarium and Rhizomania, 14% said they had no soilborne disease issues and two percent listed Fusarium as their biggest issue while one percent said Rhizomania was their biggest soilborne disease problem (Table 8). Additionally, participants were asked about the prevalence of Rhizoctonia in sugarbeet with which preceding crops. Fifty two percent of respondents said they saw more rhizoctonia when soybeans preceded their sugarbeet crop. Eighteen percent reported more Rhizoctonia following edible beans, 11% saw more Rhizoctonia following any field corn, five percent said any crop, 4% said small grains and other crop and 1% stated sweet corn or potatoes as the crop preceding sugarbeets they saw the most Rhizoctonia develop (Table 9). Of the respondents to the question regarding whether a specialty variety was used for Rhizoctonia, 65% respondents said yes they did use a specialty variety for Rhizoctonia while 35% said no (Table 10).

Participants were asked what methods were used to control Rhizoctonia and 40% said they used a seed treatment only, 22% used a seed treatment and a POST fungicide and another 26% used a seed treatment plus an in-furrow fungicide while 10% also said they used a seed treatment, in-furrow fungicide and a POST fungicide while one percent used a seed treatment followed by an in-furrow spray and two POST applications (Table 11). Eighty eight percent of respondents used a Kabina seed treatment while 5% used Vibrance, 3% used Metlock Suite + Vibrance, 3% used Systiva, and 1% used Metlock Suite and Kabina (Table 12). Of the respondents who applied an in-furrow fungicide, 57% used Azteroid, 6% used Quadris or generic, 3% used other and one percent used Headline or Zanthion; 34% of respondents used no fungicide in-furrow (Table 13).

Respondents were asked what POST fungicides were used to control Rhizoctonia and 37% did not use a POST fungicide to control Rhizoctonia. Forty one percent used Quadris or generic, 6% used Azteroid, 10% used Proline, four percent used Priaxor and 2% used Excalia while one percent used other (Table 14). Participants were then asked to grade the effectiveness of the POST fungicides that were used. Thirty nine percent were unsure of their results, 41% said they had good results, 8% reported fair results, 11% said the fungicides performed excellently and 2% said they performed poorly (Table 15). Respondents were also asked how they applied POST fungicide and 26% stated they used a band application and 32% used a broadcast application while 42% said that they did not use a POST application (Table 16). Seventy six percent of growers reported that they used an in-furrow starter fertilizer while 24% did not (Table 17). Seventy seven percent of respondents used 10-34-0, 15% used an other starter fertilizer, six percent used Redline and 3 percent used Paralign (Table 18).

Participants were also asked about use of waste lime to control Aphanomyces. Seventy one percent of participants did not use waste lime in their fields while 18% used between 6 and 10 tons/acre while 11% used less than 5 tons/acre (Table 19). The growers were asked how effective their waste lime application was. Sixty three percent of respondents did not apply lime, 16% said they had good results and another 13% were unsure of their results, 4%

said excellent and 4% reported fair results (Table 20). One of the survey questions also asked if growers had used a specialty variety for *Aphanomyces* in 2021. Fifty five percent of respondents said no and 45% said yes (Table 21).

Survey respondents were asked about how many acres were planted to CR+ in 2022. Forty two percent said they planted no CR+ acres, 7% planted between 1% and 20%, 25% reported planting between 21% and 50% while 17% planted between 51% and 60% of their acres to CR+ varieties and 5% planted between 61 and 70% of their acres to CR+ varieties and two percent planted more than 70% of their acres to CR+ varieties (Table 22). Growers were then asked to rate the effectiveness of CR+ varieties in controlling CLS. Forty one percent of growers did not use CR+ varieties, 33% said their CLS control was excellent, 15% reported good CLS control, four percent reported fair levels of effectiveness, two percent said poor while another 6% were unsure (Table 23). Growers were also asked about CLS control on non-CR+ varieties. Fifty nine percent of respondents said that had good control, 17% said fair levels of CLS control, 16% said excellent, seven percent did not use traditional varieties and one percent were unsure (Table 24).

Survey participants were then asked a series of questions regarding their CLS fungicide practices on CR+ varieties on sugarbeet in 2022. Thirty percent said that they used 3 sprays to control CLS, 25% used four applications, 20% used two applications, 11% used zero applications, 8% used one application, 5% used five applications while >1% used more than seven applications (Table 25). Survey participants were also asked how many CLS applications were made to control CLS on non-CR+ varieties. Thirty percent said four applications, 23% used three applications, 20% used five applications, 13% used six applications, seven percent said two applications, four percent said zero applications, while two percent each said one spray and seven sprays on non-CR+ varieties (Table 26). Respondents were then asked about the effectiveness of their CLS sprays. Seventy two percent said they had good results, 17% said they had excellent results, nine percent reported fair results while one percent each reported poor results or no applications (Table 27).

Respondents were asked about when their CLS application started and ended. Forty six percent of participants said that they began their applications between July 1 and 10, 24% said they started before July 1, 22% said it was between July 11 and 20, 6% said between July 21 and July 31 and 1% said between August 1 and 10 and after August 10 (Table 28). Fifty three percent of respondents said that their last CLS spray was between September 1 and 10, 22% said between August 21 and 31, 17% said between September 11 and 20 and 8% said between August 11 and 20 (Table 29). Growers were also asked if they used fungicide mixtures for all of their CLS applications. Eighty five percent said yes while 15% said no (Table 30).

Sixty one percent of survey respondents made 100% of their CLS applications by ground application. Sixteen percent made 81-99% of their applications from the ground, another 10% made between 61 and 80% from the ground. Nine percent made 0% percent of their CLS applications from the ground while five percent had between 41% and 60% of their application made by ground rig (Table 31).

Of the total fungicide applications for CLS, 63% did not use an aerial applicator, 22% used an aerial applicator for 1-20% of their applications while five percent respectively made between 21-40%, 41-60% and 100% of their applications from an aerial application (Table 32).

Regarding water usage in gallons per acre as applied by tractor, 54% of respondents used 16-20 gallons per acre, 28% used 11-15 gallons per acre, 16% used more than 20 gallons per acre, 1% used 6-10 gallons per acre and >1% used 1-5 gallons per acre (Table 32).

**Table 1. 2023 Fargo Grower Seminar – Number of survey respondents by county growing sugarbeet in 2022.**

County	Number of Responses	Percent of Responses
Barnes	-	-
Becker	-	-
Cass	3	10
Clay	11	38
Norman/Mahnomen	10	35
Ransom	-	-
Richland	-	-
Steele	-	-
Trail	5	17
Wilkin/Otter Tail	-	-
Total	29	100

**Table 2. 2023 Grafton Grower Seminar – Number of survey respondents by county growing sugarbeet in 2022.**

County	Number of Responses	Percent of Responses
Cavalier	-	-
Grand Forks	4	8
Kittson	6	12
Marshall	6	12
Nelson	-	-
Pembina	14	28
Polk	-	-
Ramsey	-	-
Walsh	19	38
Other	1	2
Total	50	100

**Table 3. 2023 Grand Forks Grower Seminar – Number of survey respondents by county growing sugarbeet in 2022.**

County	Number of Responses	Percent of Responses
Grand Forks	15	25
Mahnomen	-	-
Marshall	4	7
Nelson	2	3
Pennington/Red Lake	-	-
Polk	29	48
Steele	-	-
Traill	3	5
Walsh	3	5
Other	5	8
Total	61	101

**Table 4. 2023 Wahpeton Grower Seminar – Number of survey respondents by county growing sugarbeet in 2022.**

County	Number of Responses	Percent of Responses
Cass	1	2
Clay	3	7

Grant	4	10
Otter Tail	-	-
Ransom	-	-
Richland	11	26
Roberts	-	-
Stevens	-	-
Traverse	3	7
Wilkin	20	48
Total	42	100

**Table 5. 2023 Willmar Grower Seminar - Number of survey respondents by county growing sugarbeet in 2022.**

County	Number of Responses	Percent of Responses
Chippewa	30	40
Kandiyohi	7	9
Pope	-	-
Redwood	2	3
Renville	22	29
Stearns	1	1
Stevens	2	3
Swift	6	8
Other	5	7
Total	75	100

**Table 5. Total sugarbeet acreage operated by respondents in 2022.**

Location	Responses	Acres of sugarbeet									
		<99	100-199	200-299	300-399	400-599	600-799	800-999	1000-1499	1500-1999	2000+
		-----% of responses-----									
Fargo	23	-	-	4	22	26	17	4	13	4	9
Grafton	46	2	11	7	15	17	11	9	15	9	4
Grand Forks	63	3	10	6	8	29	16	16	13	-	-
Willmar	73	7	11	15	11	18	12	10	10	4	3
Total	205	4	9	9	12	22	14	11	12	4	3

**Table 6. What crop preceded most of your sugarbeet acreage in 2022?**

Location	Respondents	Sweet								Other
		Field Corn	Corn	Dry Bean	Peas	Potato	Soybean	Wheat		
		-----% of respondents-----								
Fargo	27	4	-	-	-	-	15	78	4	
Grafton	44	-	-	9	-	9	2	80	-	
Grand Forks	64	-	-	-	-	6	11	81	2	
Wahpeton	42	21	-	-	-	-	24	55	-	
Willmar	73	70	14	-	-	-	15	1	-	
Total	250	24	4	2	-	3	13	53	1	

**Table 7. What was your most serious production problem?**

Location	Respondents	Herbicide					Root	
		Aph	CLS	Emergence	Fusarium	Injury	Rhizoc	Rhizomania

	-----% of respondents-----									
Fargo	24	-	8	17	-	13	-	-	4	58
Grafton	42	2	26	12	-	-	7	2	7	43
Grand Forks	59	-	3	14	-	-	9	-	10	64
Wahpeton	40	-	3	43	-	-	28	-	-	28
Willmar	76	1	5	12	-	-	12	3	-	67
Total	241	1	8	18	-	1	12	1	4	55

**Table 8. What soil-borne diseases affected your sugarbeet production in 2022?**

Location	Respondents	Root disease					
		Rhizoctonia	Aphanomyces	Fusarium	Rhizomania	All	None
		-----% of respondents-----					
Fargo	24	46	8	8	4	25	8
Grafton	44	59	18	2	-	2	18
Grand Forks	62	50	11	2	2	13	23
Willmar	73	66	14	1	1	12	6
Total	203	57	13	2	1	12	14

**Table 9. With which of the preceding crops did you see the most rhizoctonia in 2022?**

Location	Respondents	Edible	Field				Small	Any	Other
		Beans	Corn	Sweet Corn	Potatoes	Grains	Soybeans	Crop	
		-----% of respondents-----							
Fargo	13	8	-	-	-	-	77	8	8
Grafton	34	38	-	-	-	3	44	9	6
Grand Forks	49	29	4	-	4	10	45	4	4
Willmar	67	3	24	2	-	-	57	15	-
Total	163	18	11	1	1	4	52	10	3

**Table 10. Did you use a specialty variety to control Rhizoctonia in 2022?**

Location	Respondents	Yes		No	
		-----% respondents-----			
Fargo	24	71	29		
Grafton	42	62	38		
Grand Forks	59	83	17		
Total	71	65	35		

**Table 11. What methods were used to control *Rhizoctonia solani* in 2023?**

Location	Respondents	Seed Treatment	Seed Treatment	Seed Treatment	Seed Treatment	Seed Treatment
		Only	+ In-Furrow	+ POST	+ In-Furrow + POST	+ In-Furrow + 2xs POST
		-----% respondents-----				
Fargo	21	29	38	33	-	-

Grafton	43	37	26	19	19	-
Grand Forks	62	31	31	27	8	3
Wahpeton	40	88	8	3	3	-
Willmar	70	27	30	27	14	1
Total	236	40	26	22	10	1

**Table 12. Which seed treatment did you use to control *Rhizoctonia solani* in 2022?**

Location	Respondents	Seed treatment				
		Kabina	Metlock Suite + Kabina	Vibrance	Systiva	Metlock Suite + Vibrance
-----% of respondents-----						
Fargo	22	96	-	5	-	-
Grafton	39	85	-	8	3	5
Grand Forks	54	87	2	4	4	4
Total	115	88	1	5	3	3

**Table 13. Which fungicide did you apply in-furrow to control *R. solani* in 2022?**

Location	Respondents	In-furrow fungicide use				
		Azteroid	Quadris or Generic	Headline or Xanthion	Other	None
-----% of respondents-----						
Fargo	19	53	11	-	-	37
Grafton	46	59	7	2	2	30
Grand Forks	54	57	4	-	4	35
Total	119	57	6	1	3	34

**Table 14. Which POST fungicide did you use to control *R. solani* in 2022?**

Location	Respondents	POST fungicide							
		Azteroid	Azterknot	Excalia	Quadris or generic	Proline	Priaxor	Other	None
-----% of respondents-----									
Fargo	22	-	-	14	37	14	-	-	37
Grafton	42	5	-	-	41	24	7	2	21
Grand Forks	55	4	-	-	49	2	7	-	38
Willmar	69	10	-	2	38	6	-	-	45
Total	188	6	-	2	41	10	4	1	37

**Table 15. How effective were your POST fungicides at controlling *Rhizoctonia solani* in 2022?**

Location	Respondents	Effectiveness of fungicides				
		Excellent	Good	Fair	Poor	Unsure
-----% of respondents-----						
Fargo	18	11	56	6	-	28
Grafton	41	20	56	10	2	12
Grand Forks	55	9	55	5	2	29
Willmar	65	6	15	11	2	66
Total	179	11	41	8	2	39

**Table 16. How did you apply POST fungicides to control *Rhizoctonia* in 2022?**

Location	Respondents	Application method		
		Band	Broadcast	None
-----% respondents-----				
Fargo	23	17	44	39
Grafton	43	16	58	26

Grand Forks	60	28	33	38
Willmar	72	33	11	56
Total	198	26	32	42

**Table 17. Did you apply any in-furrow starter fertilizer in 2022?**

Location	Respondents	Variety type	
		Yes	No
		-----% respondents-----	
Fargo	27	85	15
Grafton	46	78	22
Grand Forks	63	94	6
Wahpeton	39	39	62
Total	175	76	24

**Table 18. Which starter fertilizer did you use in 2022?**

Location	Respondents	Starter Fertilizer Type			
		10-34-0	Paralign	Redline	Other
		-----% of respondents-----			
Fargo	20	80	-	5	15
Grafton	42	69	-	7	24
Grand Forks	53	81	6	6	8
Total	115	77	3	6	15

**Table 19. What rate of precipitated calcium carbonate (waste lime) did you use in 2022?**

Location	Respondents	Lime use rate		
		None	>5 T/A	6-10 T/A
		-----% of respondents-----		
Fargo	26	62	-	39
Grafton	42	76	5	19
Grand Forks	58	81	-	19
Willmar	72	64	28	8
Total	198	71	11	18

**Table 20. How effective was waste lime at controlling aphanomyces in 2022?**

Location	Respondents	Waste lime effectiveness					No Lime
		Excellent	Good	Fair	Poor	Unsure	
		-----% of respondents-----					
Fargo	22	14	23	-	-	9	55
Grafton	44	5	18	2	-	11	64
Grand Forks	59	5	12	2	-	17	64
Willmar	72	-	17	7	-	11	65
Total	197	4	16	4	-	13	63

**Table 21. Did you use a specialty variety to control Aphanomyces in 2022?**

Location	Respondents	Yes	No
		-----% respondents-----	
Fargo	25	60	40
Grafton	43	47	54
Grand Forks	58	38	62
Total	126	45	55

**Table 22. What percentage of your acres were planted to CR+ varieties in 2022?**

Location	Respondents	CR+ effectiveness					
		0%	1%-20%	21%-50%	51%-60%	61%-70%	70%+
		-----% of respondents-----					
Fargo	25	12	4	32	24	12	8
Grafton	43	33	5	35	23	5	-
Grand Forks	58	62	10	16	9	2	-
Total	126	42	7	25	17	5	2

**Table 23. How effective was CLS control on CR+ varieties in 2022?**

Location	Respondents	CR+ effectiveness					
		Excellent	Good	Fair	Poor	Unsure	Did not use
		-----% of respondents-----					
Fargo	23	39	26	9	-	9	17
Grafton	46	48	20	2	2	-	28
Grand Forks	58	19	7	4	2	9	60
Total	127	33	15	4	2	6	41

**Table 24. How effective was CLS control on non-CR+ varieties in 2022?**

Location	Respondents	CR+ effectiveness					
		Excellent	Good	Fair	Poor	Unsure	Did not use
		-----% of respondents-----					
Fargo	23	4	78	17	-	-	-
Grafton	43	7	61	21	-	-	12
Grand Forks	57	28	49	14	-	2	7
Total	123	16	59	17	-	1	7

**Table 25. How many fungicide application did you make on CR+ varieties to control CLS in 2022?**

Location	Respondents	Number of applications									
		0	1	2	3	4	5	6	7	>7	
		-----% of respondents-----									
Fargo	23	4	9	30	35	13	9	-	-	-	
Grafton	41	15	32	27	27	-	-	-	-	-	
Grand Forks	45	20	-	22	24	24	9	-	-	-	
Wahpeton	41	-	5	20	24	49	2	-	-	-	
Willmar	71	11	-	11	38	31	7	-	-	1	
Total	221	11	8	20	30	25	5	-	-	>1	

**Table 26. How many fungicide application did you make on non-CR+ varieties to control CLS in 2022?**

Location	Respondents	Number of applications									
		0	1	2	3	4	5	6	7	>7	
		-----% of respondents-----									
Fargo	22	-	-	5	23	59	14	-	-	-	
Grafton	43	2	2	28	54	14	-	-	-	-	



Grand Forks	56	-	4	2	23	55	16	-	-	-
Willmar	68	10	-	-	4	9	37	35	4	-
Total	189	4	2	7	23	30	20	13	2	-

**Table 27. How effective were your fungicide applications on CLS in 2022?**

Location	Respondents	Effectiveness of CLS sprays					No applications
		Excellent	Good	Fair	Poor	Unsure	
		-----% of respondents-----					
Fargo	23	13	83	-	-	-	4
Grafton	44	5	82	11	2	-	-
Grand Forks	56	29	61	11	-	-	-
Total	123	17	72	9	1	-	1

**Table 28. What date was your first CLS application?**

Location	Respondents	Date of first CLS application					
		Before July				After	
		1	July 1-10	July 11-20	July 21-31	August 1-10	August 10
		-----% of respondents-----					
Fargo	24	13	67	21	-	-	-
Grafton	44	-	18	50	25	5	2
Grand Forks	58	9	54	29	7	2	-
Wahpeton	42	50	41	10	-	-	-
Willmar	73	40	55	6	-	-	-
Total	241	24	46	22	6	1	1

**Table 29. What date was your last CLS application in 2022?**

Location	Respondents	Date of last CLS application							Later than Sept 20	Made zero or 1 CLS applications
		Before August				August		Sept 1-10		
		1	1-10	11-20	21-31	11-20				
		-----% of respondents-----								
Fargo	24	-	-	-	42	33	25	-	-	
Grafton	46	-	-	4	17	54	24	-	-	
Grand Forks	59	-	-	2	17	56	20	3	2	
Willmar	39	5	3	5	31	44	13	-	-	
Total	72	-	-	8	22	53	17	-	-	

**Table 30. Did you use fungicide mixtures for all of your CLS applications?**

Location	Respondents	Yes		No
		-----% respondents-----		
Fargo	24	17		83
Grafton	44	14		86
Grand Forks	59	15		85
Total	127	15		85

**Table 31. What percent of total fungicide applications for CLS were made by ground application?**

Location	Respondents	Percent of total fungicide applications for CLS made by ground application						
		0%	1%-20%	21%-40%	41%-60%	61%-80%	81%-99%	100%
		-----% of respondents-----						
Fargo	22	9	-	-	14	5	18	55

Grafton	45	11	-	-	-	16	20	53
Grand Forks	58	7	-	-	5	7	12	69
Total	125	9	-	-	5	10	16	61

**Table 32. What percent of total fungicide applications for CLS were made by an aerial applicator?**

Location	Respondents	0%	1%-20%	21%-40%	41%-60%	61%-80%	81%-99%	100%
		-----% of respondents-----						
Fargo	23	57	13	4	17	-	-	9
Grafton	43	58	21	12	-	-	-	9
Grand Forks	58	72	16	2	5	-	-	5
Willmar	69	61	30	4	4	-	-	-
Total	193	63	22	5	5	-	-	5

**Table 33. How many gallons per acre of water per acre did you use to apply CLS fungicides by tractor?**

Location	Respondents	1-5	6-10	11-15	16-20	20+
		-----% of respondents-----				
Fargo	24	4	-	58	29	8
Grafton	41	-	2	56	42	-
Grand Forks	58	-	4	41	45	10
Wahpeton	39	-	-	10	77	13
Willmar	69	-	-	-	65	35
Total	231	>1	1	28	54	16