TURNING POINT SURVEY OF FUNGICIDE USE IN SUGARBEET IN MINNESOTA AND EASTERN NORTH DAKOTA IN 2021

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The seventh annual fungicide practices live polling questionnaire was conducted using Turning Point Technology at the 2022 Winter Sugarbeet Growers' Seminars held during January and February 2022. Responses are based on production practices from the 2021 growing season. The survey focuses on responses from growers in attendance at the Fargo, Grafton, Grand Forks, Wahpeton, ND and Willmar, MN Grower Seminars both in person and online. 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 2021 was calculated from Table 5 at between 1,000 and 1,499 acres.

Survey respondents were asked about soilborne disease and control practices. Fifty-nine percent said their fields were affected by Rhizoctonia, 10% said Aphanomyces was the biggest issue, Seven percent said they had issues with multiple disease including Rhizoctonia, Aphanomyces, Fusarium and Rhizomania, 21% said they had no soilborne disease issues and four percent listed Fusarium as their biggest issue (Table 8). Additionally, participants were asked about the prevalence of Rhizoctonia in sugarbeet with which preceding crops. Thirty four percent of respondents said they saw more rhizoctonia when soybeans preceded their sugarbeet crop. Nineteen percent reported more Rhizoctonia following edible beans and small grains, 18% saw more Rhizoctonia following any crop, five percent said other crop, 4% said field corn and 1% stated sweet corn 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, 67% respondents said yes they did use a specialty variety for Rhizoctonia while 33% said no (Table 10).

Participants were asked what methods were used to control Rhizoctonia and 45% said they used a seed treatment only, 20% used a seed treatment and a POST fungicide and another 20% used a seed treatment plus an in-furrow fungicide while 15% also said they used a seed treatment, in-furrow fungicide and a POST fungicide (Table 11). Sixty three percent of respondents used a Kabina seed treatment while 16% used Vibrance, 10% used Metlock Suite + Kabina, 9% used Systiva, and 1% used Metlock Suite and Vibrance (Table 12). Of the respondents who applied an in-furrow fungicide, 58% used Azteroid, 8% used Quadris or generic and 1% used other; 32% 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 eight percent used Quadris or generic, 8% used Azteroid, 4% used Proline and 2% used Priaxor (Table 14). Participants were then asked to grade the effectiveness of the POST fungicides that were used. Forty two percent were unsure of their results, 35% said they had good results, 12% reported fair results, 9% said the fungicides performed excellently and 2% said they performed poorly (Table 15). Respondents were also asked how they applied POST fungicide and 51% stated they used a band application and 49% used a broadcast application (Table 16). Sixty three percent of growers reported that they used an in-furrow starter fertilizer while 37% did not (Table 17).

Participants were also asked about use of waste lime to control Aphanomyces. Fifty five percent of participants did not use waste lime in their fields while 31% used between 6 and 10 tons/acre while 14% used less than 5 tons/acre (Table 18). Respondents were also asked about their soil pH. Forty six percent said it was between 8.0 and 8.5, 41% said between 7.5 and 8.0, 11% between 7.0 and 7.5 and 2% said between 6.0 and 6.5 (Table 19). The growers were asked how effective their waste lime application was. Forty eight percent of respondents did not apply lime, 19% said they had good results and another 19% were unsure of their results, 11% said excellent and 3% reported fair results (Table 20). One of the survey questions also asked if growers had used a specialty variety for Aphanomyces in 2021. Fifty eight percent of respondents said yes and 42% said no (Table 21).

Survey respondents were asked about how many acres were planted to CR+ in 2021. Seventy one percent said they planted no CR+ acres, 17% planted between 1% and 20%, 6% reported planting between 21% and 50% while 2% planted between 51% and 60% of their acres to CR+ varieties (Table 22). Growers were then asked to rate the effectiveness of CR+ varieties in controlling CLS. Sixty eight percent of growers did not use CR+ varieties, 16% said their CLS control was excellent, 10% reported good CLS control while another 5% were unsure (Table 23).

Survey participants were then asked a series of questions regarding their CLS fungicide practices on sugarbeet in 2021. Thirty three percent said that they used 5 sprays to control CLS, 20% used four applications, 18% used six applications, 17% used three applications, 5% used seven applications, 3% used two applications, 2% used one application and another 2% applied no CLS applications (Table 24). Respondents were then asked about the effectiveness of their CLS sprays. Sixty two percent said they had good results, 15% said they had fair results, 14% reported excellent results while 8% reported poor results (Table 25).

Respondents were asked about when their CLS application started and ended. Thirty nine percent of participants said that they began their applications between July 1 and 10, 38% said they started before July 1, 14% said it was between July 11 and 20, 9% said between July 21 and July 31 and 1% said between August 1 and 10 (Table 26). Forty seven percent of respondents said that their last CLS spray was between September 1 and 10, 22% said between September 11 and 20, 19% said between August 21 and 31, 7% said between August 11 and 20, 4% said after September 20, and 1% they made zero or one CLS application (Table 27). Growers were also asked if they used fungicide mixtures for all of their CLS applications. Seventy three percent said yes while 27% said no (Table 28).

Sixty three percent of survey respondents made 100% of their CLS applications by ground application. Thirteen percent made 61-80% of their application from the ground, another 10% made between 81 and 99% from the ground. Eight percent made between 0% percent of their CLS applications from the ground, five percent had between 1% and 20% of their application made by ground rig while two percent had between 21 and 40% of their applications made on the ground (Table 29).

Of the total fungicide applications for CLS, 33% did not use an aerial applicator, 30% used an aerial applicator for 100% of their applications, 23% used an aerial applicator for 1-20% of their fungicide applications, 6% said they used an aerial applicator for 61-80% of applications, 4% fell in the 81-99% range and 3%in the 21-40% range (Table 30).

Regarding water usage in gallons per acre as applied by tractor, 55% of respondents used 16-20 gallons per acre, 28% used 11-15 gallons per acre, 14% used more than 20 gallons per acre, 2% used 6-10 gallons per acre and 1% used 1-5 gallons per acre (Table 31).

Table 1. 2022 Fargo Grower Seminar – Number of survey respondents by county growing sugarbeet in 2021.

County	Number of Responses	Percent of Responses
Barnes	-	-
Becker	-	-
Cass	2	29
Clay	1	14
Mahnomen	2	29
Ransom	-	-
Richland	1	14
Steele	-	-
Trail	1	14
Otter Tail	-	-
Total	7	100

Table 2. 2022 Grafton Grower Seminar – Number of survey respondents by county growing sugarbeet in 2021.

County	Number of Responses	Percent of Responses
Cavalier	-	-
Grand Forks	1	6
Kittson	1	6
Marshall	2	13
Nelson	-	-
Pembina	4	25
Polk	-	-
Ramsey	-	-
Walsh	6	38
Other	2	13
Total	16	101

Table 3. 2022 Grand Forks Grower Seminar – Number of survey respondents by county growing sugarbeet in 2021.

County	Number of Responses	Percent of Responses
Grand Forks	7	18
Mahnomen	1	3
Marshall	2	5
Nelson	-	-
Pennington/Red Lake	-	-
Polk	17	44
Steele	-	-
Traill	1	3
Walsh	2	5
Other	9	23
Total	39	101

Table 4. 2022 Wahpeton Grower Seminar – Number of survey respondents by county growing sugarbeet in 2021.

County	Number of Responses	Percent of Responses
Cass	-	-
Clay	7	11
Grant	6	9
Otter Tail	-	-
Ransom	-	-
Richland	16	25
Roberts	-	-
Stevens	-	-
Traverse	3	5
Wilkin	33	51
Total	65	101

Table 5. Total sugarbeet acreage operated by respondents in 2021.

		Acres of sugarbeet									
Location	Responses	<99	100-199	200-299	300-399	400-599	600-799	800-999	1000-1499	1500-1999	2000+
		% of responses									
Fargo	12	17	-	-	17	17	8	-	17	17	8
Grafton	16	13	6	-	13	19	6	19	13	6	6
Grand Forks	38	13	8	3	11	16	11	11	8	3	18
Wahpeton	65	-	11	-	34	-	17	-	39	-	-
Willmar	37	24	5	11	3	16	14	3	16	5	3
Total	168	11	8	3	18	10	13	5	23	4	6

Table 6. What crop preceded most of your sugarbeet acreage in 2021?

Location	Respondents	Field Corn	Sweet Corn	Dry Bean	Peas	Potato	Soybean	Wheat	Other
		% of respondents							
Fargo	14	-	-	-	-	-	7	86	7
Grafton	15	-	-	20	-	7	7	67	-
Grand Forks	39	3	-	-	-	-	-	95	3
Wahpeton	65	14	-	-	-	-	20	66	-
Willmar	40	70	20	-	-	-	8	3	-
Total	173	22	5	2	-	1	10	60	1

Table 7. What was your most serious production problem?

Location	Respondents	Aph	CLS	Emergence	Fusarium	Herbicide Injury	Rhizoc	Rhizomania	Root Maggot	Weeds
		% of respondents								
Fargo	14	-	57	14	7	-	14	-	-	7
Grafton	17	6	59	18	-	-	-	-	12	6
Grand Forks	39	-	36	28	-	-	8	-	3	26
Wahpeton	63	-	21	24	-	2	13	-	-	41
Willmar	40	-	15	25	-	5	13	-	-	43
Total	173	1	29	24	1	2	10	-	2	32

Table 8. What soil-borne diseases affected your sugarbeet production in 2021?

		Root disease					
Location	Respondents	Rhizoctonia	Aphanomyces	Fusarium	Rhizomania	All	None
		% of respondents					
Fargo	14	50	7	21	-	14	7
Grafton	11	64	18	-	-	-	18
Grand Forks	44	61	9	1	-	7	23
Willmar	33	58	9	3	-	6	24
Total	102	59	10	4	-	7	21

Table 9. With which of the preceding crops did you see the most rhizoctonia in 2021?

Location	Respondents	Edible Beans	Field Corn	Sweet Corn	Potatoes	Small Grains	Soybeans	Any Crop	Other
		% of respondents							
Fargo	9	22	-	-	-	-	56	22	-
Grafton	10	70	-	-	-	10	10	10	-
Grand Forks	44	14	2	-	-	36	27	9	11
Willmar	28	7	11	4	-	-	46	32	-
Total	91	19	4	1	-	19	34	18	5

Table 10. Did you use a specialty variety to control Rhizoctonia in 2021?

Location	Respondents	Yes	No
		% respondents	
Fargo	14	93	7
Grafton	11	55	45
Grand Forks	45	62	38
Total	70	67	33

Table 11. What methods were used to control *Rhizoctonia solani* in 2021?

Location	Respondents	Seed Treatment Only	Seed Treatment + In-Furrow	Seed Treatment + POST	Seed Treatment + In-Furrow + POST	Seed Treatment + In-Furrow + 2xs POST
			% respondents			
Fargo	14	29	21	43	7	-
Grafton	13	38	-	23	38	-
Grand Forks	45	20	36	20	24	-
Wahpeton	54	81	9	7	1	-
Willmar	32	28	22	31	19	-
Total	158	45	20	20	15	-

Table 12. Which seed treatment did you use to control Rhizoctonia solani in 2021?

		Seed treatment				
Location	Respondents	Kabina	Metlock Suite + Kabina	Vibrance	Systiva	Metlock Suite + Vibrance
		% of respondents				
Fargo	13	46	8	8	38	-
Grafton	9	89	11	-	-	-
Grand Forks	45	62	1	22	2	2
Total	67	63	10	16	9	1

Table 13. Which fungicide did you apply in-furrow to control R. solani in 2021?

Location		In-furrow fungicide use			
	Respondents	Azteroid	Quadris or generic	Other	None
		% of respondents			
Fargo	15	47	13	-	40
Grafton	12	50	8	-	42
Grand Forks	45	64	7	2	27
Total	72	58	8	1	32

Table 14. Which POST fungicide did you use to control R. solani in 2021?

Location	Respondents	POST fungicide					
		Azteroid	Quadris or generic	Proline	Priaxor	Other	None
		----------% of respondents----------					
Fargo	12	-	54	8	-	-	33
Grafton	11	-	64	-	-	-	36
Grand Forks	45	9	40	4	4	-	42
Willmar	31	13	52	3	-	-	32
Total	99	8	48	4	2	-	37

Table 15. How effective were your POST fungicides at controlling Rhizoctonia solani in 2021?

Location	Respondents	Effectiveness of fungicides				
		Excellent	Good	Fair	Poor	Unsure
		----------% of respondents----------				
Fargo	10	10	40	20	-	30
Grafton	8	25	38	-	-	38
Grand Forks	45	9	36	11	2	42
Willmar	28	4	32	14	4	46
Total	91	9	35	12	2	42

Table 16. How did you apply POST fungicides to control Rhizoctonia in 2021?

Location	Respondents	Band	Broadcast
		----------% respondents----------	
Fargo	8	63	38
Grafton	7	57	43
Grand Forks	24	46	54
Total	39	51	49

Table 17. Did you apply any in-furrow starter fertilizer in 2021?

Location	Respondents	Variety type	
		Yes	No
		----------% respondents----------	
Fargo	8	88	13
Grafton	4	100	-
Grand Forks	45	93	7
Wahpeton	60	35	65
Total	117	63	37

Table 18. What rate of precipitated calcium carbonate (waste lime) did you use in 2021?

Location	Respondents	Lime use rate		
		None	>5 T/A	6-10 T/A
		----------% of respondents----------		
Fargo	10	20	-	80
Grafton	9	89	-	11
Grand Forks	43	58	2	40
Willmar	31	52	39	10
Total	93	55	14	31

Table 19. What is your soil pH?

Location	Respondents	Soil pH					
		6.0-6.5	6.5-7.0	7.0-7.5	7.5-8.0	8.0-8.5	8.5-9.0
		----------% of respondents----------					
Fargo	11	-	-	18	36	45	-
Grafton	9	-	-	-	78	22	-
Grand Forks	43	2	-	12	35	51	-
Total	63	2	-	11	41	46	-

Table 20. How effective was waste lime at controlling aphanomyces in 2021?

Location	Respondents	Waste lime effectiveness					
		Excellent	Good	Fair	Poor	Unsure	No Lime
		----------% of respondents----------					
Fargo	12	42	25	-	-	17	17
Grafton	8	12	25	-	-	13	63
Grand Forks	43	12	19	2	-	12	56
Willmar	32	-	16	6	-	31	47
Total	95	11	19	3	-	19	48

Table 21. Did you use a specialty variety to control Aphanomyces in 2021?

Location	Respondents	Yes	No
		----------% respondents----------	
Fargo	9	78	22
Grafton	8	38	63
Grand Forks	43	58	42
Total	60	58	42

Table 22. What percentage of your acres were planted to CR+ varieties in 2021?

Location	Respondents	0%	1%-20%	21%-50%	51%-60%	61%-70%	70%+
		----------% of respondents----------					
Fargo	14	79	7	7	7	-	-
Grafton	7	100	-	-	-	-	-
Grand Forks	43	91	2	2	2	-	2
Willmar	30	33	47	13	-	-	7
Total	94	71	17	6	2	-	3

Table 23. How effective was CLS control on CR+ varieties in 2021?

Location	Respondents	CR+ effectiveness					
		Excellent	Good	Fair	Poor	Unsure	Did not use
		----------% of respondents----------					
Fargo	12	33	-	-	-	-	67
Grafton	8	-	-	-	-	-	100
Grand Forks	43	-	5	-	-	5	91
Willmar	29	38	24	-	-	10	28
Total	92	16	10	-	-	5	68

Table 24. How many fungicide application did you make to control CLS in 2021?

Location	Respondents	Number of applications								
		0	1	2	3	4	5	6	7	>7
		----------% of respondents----------								
Fargo	14	-	7	-	14	29	36	14	-	-
Grafton	10	-	10	30	10	30	20	-	-	-
Grand Forks	42	7	2	2	40	36	12	-	-	-
Wahpeton	58	-	-	-	10	10	48	24	7	-
Willmar	32	-	-	3	3	9	34	38	13	-
Total	156	2	2	3	17	20	33	18	5	-

Table 25. How effective were your fungicide applications on CLS in 2021?

Location	Respondents	Effectiveness of CLS sprays					
		Excellent	Good	Fair	Poor	Unsure	No applications
		----------% of respondents----------					
Fargo	15	13	40	13	33	-	-
Grafton	13	8	54	31	8	-	-
Grand Forks	43	16	72	12	-	-	-
Total	71	14	62	15	8	-	-

Table 26. What date was your first CLS application?

Location	Respondents	Date of first CLS application					
		Before July 1	July 1-10	July 11-20	July 21-31	August 1-10	After August 10
		----------% of respondents----------					
Fargo	12	17	75	8	-	-	-
Grafton	9	-	33	22	44	-	-
Grand Forks	43	5	42	37	14	2	-
Wahpeton	53	57	36	4	4	-	-
Willmar	31	71	26	-	3	-	-
Total	148	38	39	14	9	1	-

Table 27. What date was your last CLS application in 2021?

Location	Respondents	Date of last CLS application							
		Before August 1	August 1-10	August 11-20	August 21-31	Sept 1-10	Sept 11-20	Later than Sept 20	Made zero or 1 CLS applications
		----------% of respondents----------							
Fargo	10	-	-	-	10	70	20	-	-
Grafton	11	-	-	-	9	45	27	9	9
Grand Forks	42	-	-	7	29	45	14	5	-
Willmar	28	-	-	11	11	43	32	4	-
Total	91	-	-	7	19	47	22	4	1

Table 28. Did you use fungicide mixtures for all of your CLS applications?

Location	Respondents	Yes	No
		----------% respondents----------	
Fargo	13	69	31
Grafton	9	33	67
Grand Forks	42	83	17
Total	64	73	27

Table 29. What percent of total fungicide applications for CLS were made by ground application?

Location	Respondents	0%	1%-20%	21%-40%	41%-60%	61%-80%	81%-99%	100%
		----------% of respondents----------						
Fargo	13	8	8	8	-	-	15	62
Grafton	8	-	-	-	-	38	13	50
Grand Forks	42	10	5	-	-	12	7	67
Total	63	8	5	2	-	13	10	63

Table 30. 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	13	62	15	-	-	8	8	8
Grafton	8	63	38	-	-	-	-	-
Grand Forks	42	10	5	-	-	12	7	67
Willmar	33	45	45	9	-	-	-	-
Total	96	33	23	3	-	6	4	30

Table 31. 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	14	-	-	79	14	7
Grafton	13	-	23	46	23	8
Grand Forks	44	2	2	36	55	5
Wahpeton	56	-	-	16	75	9
Willmar	35	2	-	9	51	40
Total	162	1	2	28	55	14