TURNING POINT® SURVEY OF SUGARBEET INSECT PEST PROBLEMS AND MANAGEMENT PRACTICES IN MINNESOTA AND EASTERN NORTH DAKOTA IN 2023

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Attendees of the 2024 Winter Sugarbeet Grower Seminars held at Fargo, Grafton, Grand Forks, and Wahpeton, ND were asked about their 2023 insect pest issues and associated management practices in a live polling session by using a Turning Point® interactive personal response system.

Initial questioning included identifying the county in which grower respondents produced the majority of their sugarbeet crop in 2023. Those results are presented in Tables 1-4. Most (64%) of Fargo seminar attendees indicated that the majority of their sugarbeet crop was grown in Clay, Norman, or Mahnomen counties of Minnesota, and an additional 24% reported having produced most of their crop in Cass County, ND (Table 1). The remaining producers responded that they produced the majority of their sugarbeet crop in either Barnes or Becker County, MN (6% each).

Table 1. 2024 Fargo Grower Seminar – county in which sugarbeet was grown in 2023

County	Number of responses	Percent of responses
Barnes	1	6
Becker	1	6
Cass	4	24
Clay	6	35
Norman/Mahnomen	5	29
Totals	17	100

The majority (78%) of attendees at the Grafton grower seminar reported that most of their sugarbeet production acreage was located in either Pembina or Walsh County, ND (Table 2). Kittson County, MN accounted for an additional 9% of the Grafton seminar attendees. Of the remainder, 6% produced most of their sugarbeet in Grand Forks County, ND, and an additional 3% each grew the majority of their sugarbeet crop in either Cavalier County, ND or Kittson County, MN.

Table 2. 2024 Grafton Grower Seminar – county in which sugarbeet was grown in 2023

County	Number of responses	Percent of responses
Cavalier	1	3
Grand Forks	2	6
Kittson	3	9
Marshall	1	3
Pembina	13	39
Walsh	13	39
Totals	33	100

The largest portion (44%) of Grand Forks grower seminar attendees indicated that the majority of their sugarbeet production occurred in Polk County, MN (Table 3). An additional 24% of grower attendees at Grand Forks responded that most of their sugarbeet was grown in Grand Forks County, ND. Other counties represented by grower attendees at Grand Forks included Marshall County, MN and Traill County, ND (6% of grower respondents each), and Walsh County, ND (3%).

Table 3. 2024 Grand Forks Grower Seminar – county in which sugarbeet was grown in 2023

County	Number of responses	Percent of responses
Grand Forks	15	25
Marshall	4	7
Nelson	2	3
Polk	29	47
Traill	3	5
Walsh	3	5
Other	5	8
Totals	61	100

Responses to this question at the Wahpeton winter sugarbeet grower seminar indicated that 47% of the attending producers grew the majority of their sugarbeet crop in Wilkin County, MN, with another 16% of the respondents reporting that most of their crop was produced in Richland County, ND (Table 4). An additional 11% of grower attendees at the Wahpeton seminar indicated that most of their sugarbeet production occurred in Clay County, MN, with the remainder of respondents responding that they produced the majority of their beet crop in Grant or Traverse County, MN, Cass County, ND, or Roberts County, SD in 2023.

Table 4. 2024 Wahpeton Grower Seminar – county in which sugarbeet was grown in 2023

County	Number of responses	Percent of responses
Cass	1	2
Clay	3	7
Grant	4	10
Richland	11	26
Traverse	3	7
Wilkin	20	48
Totals	42	100

This report is based on grower responses about their production activities on an estimated 134,750 acres of sugarbeet grown in 2023 by 181 grower respondents that attended the 2024 Fargo, Grafton, Grand Forks, and Wahpeton Winter Sugarbeet Grower seminars (Table 5). The majority (32%) of respondents reported growing sugarbeet on between 400 and 799 acres during the 2023 production season. That represents a shift upward in acres per grower from previous years, when the majority of growers produced sugarbeet on an average of between 300 and 599 acres. An additional 21% of producers grew sugarbeet on between 600 and 999 acres, and 25% produced beets on between 800 and 1,500 acres. A total of 11% of respondents reported growing sugarbeet on 1,500 acres or more in 2023, whereas, 21% of respondents produced sugarbeet on 299 or less acres.

Table 5. Ranges of sugarbeet acreage operated by respondents in 2023

		Acres of sugarbeet									
Location	Number of responses	<99	100-199	200-299	300-399	400-599	600-799	800-999	1000-1499	1500-1999	2000+
		% of responses									
Fargo	15	13	13	7	13	27	20	0	7	0	0
Grafton	30	0	10	0	7	13	10	7	37	10	7
Grand Forks	65	11	9	5	11	17	11	12	12	5	8
Wahpeton	71	3	8	10	13	21	15	6	15	8	0
Totals	181	6	9	6	11	19	13	8	17	7	4

From a combined total of 171 respondents at the Fargo, Grafton, Grand Forks, and Wahpeton seminars, 41% identified the sugarbeet root maggot (SBRM) as their worst insect pest problem in 2023 (Table 6). That was a 17% increase from the responses recorded during the 2023 grower seminars. Additionally, about 30% of all seminar location respondents viewed grasshoppers as their worst insect pest problem in during the 2023 growing season. Cutworms were rated as the worst pest by about 16% of all seminar respondents. Other insect groups identified as

causing problems in 2023 included springtails, Lygus bugs, white grubs, and wireworms (5, 2, 1.8, and 1%, of the respondents, respectively, at across the four seminar locations.

Grasshoppers were reported as the worst insect problem for 42, 23, 21, and 39% of grower seminar respondents at Fargo, Grafton, Grand Forks, and Wahpeton, respectively. The majority of respondents at Grafton (74%) and Grand Forks (64%) identified the SBRM as their worst insect pest problem. Those responses equated to 42 and 31% increases in the numbers of Grafton and Grand Forks seminar attendees identifying root maggots as their key insect problem when compared to that reported for 2022, which suggests increasing grower awareness and concern regarding the severity of SBRM populations on their farms. Cutworms were viewed as the most significant insect pest problem by 39% of Wahpeton seminar attendees and 8% of Fargo attendees. There were no further responses on cutworms at the other seminar locations. Springtails were identified as the worst insect pest problem by 10% of Grand Forks seminar respondents and 5% of Wahpeton respondents, but there were no responses identifying springtails regarding this question at Fargo or Grafton. Overall, the frequency of responses identifying springtails as being the major insect pest problem was considerably lower than in previous years.

Table 6. Worst insect pest problem in sugarbeet in 2023

Location	No. of responses	Army-worms	Cut-worms	Grass-hoppers	Lygus Bugs	Root maggot	Spring-tails	White Grubs	Wire-worms	Other
		% of responses								
Fargo	12	0	8	42	17	33	0	0	0	0
Grafton	35	0	0	23	3	74	0	0	0	0
Grand Forks	58	0	0	21	2	64	10	0	0	3
Wahpeton	66	2	39	39	0	6	5	5	3	2
Totals	171	1	16	30	2	42	5	2	1	2

A combined total of 84% of all grower respondents at across all winter grower seminars indicated that they used some form of insecticide to manage insect pests in 2023, which was down slightly from 89% as reported for 2022 (Table 7). The majority (36%) of respondents from all grower seminar locations reported that they planted seed treated with Poncho Beta insecticidal seed treatment. An average of 18% reported using Counter 20G for at-plant protection from insect pests, and the remaining producers indicated that they applied either Midac FC (13%) or Mustang Maxx (9%), or they used either Cruiser (4%) or NipsIt Inside (4%) seed treatment. The most substantial change in use for this purpose, when averaged for respondents at all seminar locations, was that Midac FC use increased by about 116% when compared to reported use from the 2022 growing season. The majority of planting-time insecticide use in 2023 was carried out by growers that attended the Fargo, Grafton, and Grand Forks seminars, at which 87, 96, and 96% of respondents, respectively, reported using insecticidal protection at planting. Although fewer (i.e., 61% overall) Wahpeton seminar respondents responded as having used an insecticide at planting than those at the other seminar locations, that figure represented a 49% increase in insecticide use by Wahpeton respondents from 2022 to 2023.

At the Fargo seminar, 33% of producers reported using Poncho Beta insecticidal seed treatment for at-plant protection from insect pests. No other seed treatment materials were reported as being used by Fargo attendees in 2023. An additional 20% of Fargo attendees applied Counter 20G for at-plant protection from insect pests. A considerable segment (27%) of Fargo attendees applied a liquid insecticide at planting in 2023, with the majority of those applications being Mustang Maxx (27% of respondents), but another 7% of respondents reported using Midac FC for insect control in their sugarbeet crop.

The majority (42%) of Grafton respondents reported planting Poncho Beta insecticide-treated seed as at least part of their insect control program in 2023. Cruiser- and NipsIt Inside-treated seed were each used by an additional 6% of Grafton attendees. A surprisingly low proportion (19%) of Grafton seminar attendees reported using Counter 20G for planting-time insect pest management, and that was identical to the reported use of Counter 20G during the 2022 growing season. An additional 25% of respondents at Grafton indicated that they used a sprayable liquid insecticide, which involved applications of Midac FC or Mustang Maxx (21 and 4% of respondents, respectively).

At the Grand Forks seminar location, 51% of respondents reported that they used Poncho Beta-treated seed for at-plant insect control, and NipsIt Inside- and Cruiser-treated seed each reported as used by 5% of respondents. Counter 20G was reported as being used at planting by 16% of grower respondents at Grand Forks, which was a

decrease of about 45% when compared to 2022. Midac FC was reported as being used at planting by 17% of Grand Forks respondents in 2023, which represented an 89% increase in use of that product when compared to reported use during the 2022 growing season. Use of Mustang Maxx, as reported by Grand Forks respondents, was down to 1%, which was a significant decrease from 8% of attendees having reported using that insecticide in 2022.

At the Wahpeton seminar location, 18% of respondents indicated that they had applied Mustang Maxx for planting-time protection from insect pests in 2023, and 18% reported using a planting-time application of Counter 20G. An additional 16% reported that they used Poncho Beta-treated seed for insect pest management. Three percent of Wahpeton respondents reported using Midac FC for a planting-time insecticide. This was the first year of reported use of that product by Wahpeton seminar attendees.

Table 7. *Planting-time* insecticide use for sugarbeet insect pest management in 2023

Location	Number of responses	Counter 20G	Midac FC	Mustang Maxx	Poncho Beta	Cruiser	NipsIt Inside	Other	None
		% of responses							
Fargo	15	20	7	27	33	0	0	0	13
Grafton	53	19	21	4	42	6	6	0	4
Grand Forks	93	16	17	1	51	5	5	0	4
Wahpeton	76	18	3	18	16	1	1	3	39
Totals	237	18	13	9	36	4	4	1	16

Averaged across the Fargo, Grafton, Grand Forks, and Wahpeton seminar locations, the moderate (7.5 lb product/ac) rate of Counter 20G was used more frequently (12% of respondents) than any other granular insecticide application for insect management in 2023 (Table 8). Thimet 20G was used by just 2% of grower respondents, as averaged across all seminar locations. The majority of Fargo (71%), Grafton (55%), Grand Forks (72%), and Wahpeton (79%) respondents reported no use of a granular insecticide in 2023. However, 40% of the Fargo respondents that did use a granular insecticide applied Counter 20G at the 5.25-lb rate and 30% used the 7.5-lb rate, but no one at the Fargo seminar location reported applying Counter 20G at its high (8.9 lb product/ac) labeled rate.

At the Grafton seminar location, 45% of producers reported applying a granular insecticide in 2023. Eleven percent of Grafton respondents applied Counter at the high (8.9 lb) labeled rate, and 64% used it at the moderate rate of 7.5 lb product per acre. The Counter 20G use-rate patterns in 2023, as reported by Grafton respondents shifted dramatically compared to that reported for 2022, where 50% of respondents reported using the 8.9-lb rate and only 33% reported using the 7.5-lb rate.

At the Grand Forks grower seminar, 28% of respondents reported using a granular insecticide at planting in 2023. Thirty-nine percent of the Grand Forks attendees that used a granular insecticide in 2023 indicated that they applied Counter 20G at its high labeled rate. An additional 29% of respondents applied Counter at 7.5 lb product per acre, and 21% used it at the low labeled rate of 5.25 lb product per acre.

Table 8. Application rates of *granular* insecticides used for sugarbeet insect pest management in 2023

Location	Number of responses	Counter 20G			Thimet 20G		Other	None
		8.9 lb	7.5 lb	5.25 lb	7 lb	4.5 lb		
		% of responses						
Fargo	17	0	6	12	0	0	12	70
Grafton	38	5	29	0	3	5	3	55
Grand Forks	64	11	8	6	0	0	3	72
Wahpeton	70	0	9	9	1	0	3	79
Totals	189	5	12	6	1	1	4	71

Averaged across the Fargo, Grafton, Grand Forks, and Wahpeton survey locations, 38% of respondents reported using a postemergence insecticide to manage the sugarbeet root maggot (SBRM) (Table 9). That reflected a 17% decline when compared to 2022. At the Fargo seminar site, 33% of respondents reported that they had applied Mustang Maxx for postemergence root maggot control in 2023, which accounted for 100% of all insecticide use reported for that purpose by Fargo grower respondents. That is somewhat surprising because there had been some limited use of Thimet 20G for root maggot control by Fargo seminar attendees in 2022.

At the Grafton seminar location, 71% of grower respondents indicated that they used some form of postemergence insecticide for SBRM control in 2023. That reflected an 8% increase in postemergence insecticide use by Grafton respondents when compared to the reported use for the previous growing season. The majority (34%) of Grafton seminar respondents applied Thimet 20G for postemergence root maggot management, which was 48% of all respondents who used a postemergence insecticide for that purpose in 2023. An additional 27% of the Grafton respondents reported that they applied Mustang Maxx for postemergence SBRM control, and 5% indicated that they used Asana XL for postemergence root maggot management.

A total of 40% of Grand Forks seminar attendees reported using a postemergence insecticide for root maggot management in 2023, which was a 33% increase over the reported use for this purpose during the previous growing season. About two-thirds of the producer respondents at Grand Forks that did apply an insecticide for postemergence SBRM control indicated that they used Mustang Maxx, whereas, 15% used Asana XL, and an additional 13% used Thimet 20G.

Table 9. *Postemergence* insecticide use for *sugarbeet root maggot* management in 2023

Location	Number of responses	Asana XL	Mustang Maxx	Counter 20G	Thimet 20G	Other	None
		% of responses					
Fargo	15	0	33	0	0	0	67
Grafton	41	5	27	2	34	2	29
Grand Forks	65	6	26	3	5	0	60
Wahpeton	67	3	10	1	0	3	82
Totals	188	4	21	2	9	2	62

Averaged across the Fargo, Grafton, Grand Forks, and Wahpeton seminar locations, 81% of grower respondents rated their satisfaction with the insecticide applications they made for root maggot control in 2023 as good to excellent, which was a 29% increase in grower satisfaction with their SBRM management efforts when compared to survey results for the previous growing season (Table 10). An average of 12% of growers that attended the 2024 seminars rated the SBRM control performance of their insecticide program as being fair, but there were no responses indicating poor performance at any of the locations. An additional 4% of attendees across all grower seminar locations responded as being unsure of the success of their control programs for SBRM control.

Individually, grower satisfaction with insecticide performance for root maggot control in 2023 was rated as good to excellent by 50, 90, 79, and 78% of Fargo, Grafton, Grand Forks, and Wahpeton respondents, respectively. Satisfaction with insecticide performance for SBRM control was rated as fair by 33, 10, and 13, and 6% of respective respondents at the Fargo, Grafton, Grand Forks, and Wahpeton seminar locations. The most notable changes from the previous year's survey results were that the satisfaction from SBRM control efforts carried out by Fargo respondents decreased significantly, whereas the satisfaction of Grafton respondents increased by a large margin.

Table 10. *Satisfaction* with insecticide treatments for sugarbeet root maggot management in 2023

Location	Number of responses	Excellent	Good	Fair	Poor	Unsure
		% of responses				
Fargo	14	0	50	33	0	17
Grafton	36	13	77	10	0	0
Grand Forks	66	19	60	13	0	8
Wahpeton	63	28	50	6	0	17
Totals	179	18	63	12	0	7

As presented in Table 11, a combined average of 60% of grower respondents at the Fargo, Grafton, Grand Forks, and Wahpeton grower seminar locations used an insecticide for planting-time protection against springtails. That figure reflects a 17% decrease when compared to the usage reported for 2022, but it is still slightly higher than what growers reported in previous years, when the use of insecticides for springtail management hovered around 50% of growers surveyed. The majority (33%) of respondents that used an insecticide for this purpose in 2023, as

averaged across all seminar locations, planted seed treated with Poncho Beta insecticide. An additional 12% applied Counter 20G for springtail control, whereas 8% applied Midac FC for this purpose. A relatively small portion (3%) of respondents reported using Mustang Maxx for springtail control, and 40% of all growers surveyed at the four seminar locations reported not using any insecticide for springtail control, which was a significant increase in producers opting to forgo a springtail control when compared to that reported for the 2022 growing season.

At the Fargo seminar, Poncho Beta and Counter 20G were reported as being used for springtail control by 29 and 14% of respondents, respectively. About 7% of Fargo respondents indicated that they had applied Midac FC for this purpose in 2023. Somewhat surprisingly, there was no reported use of Mustang Maxx for springtail management by respondents at the Fargo grower seminar.

Most of the insecticide use for springtail management (29% of respondents), as reported by Grafton seminar attendees, involved planting seed treated with Poncho Beta. The other registered seed treatments were also used by some Grafton respondents, but at relatively low usage rates of 5% for NipsIt Inside and 2% for Cruiser. Counter 20G was reported as being used in 2023 for springtail control by 7% of Grafton respondents. The remaining use of insecticides for springtail control by attendees of the Grafton seminar included Midac FC (5% of respondents) and Mustang Maxx (2% of respondents). Thirty-four percent of Grafton attendees indicated that they did not use an insecticide for protection from springtail injury in 2023.

The highest incidence of insecticide use for springtail management in our surveys was reported by Grand Forks attendees, 84% of which used some form of insecticidal protection in their sugarbeet crop. A large majority (52%) of grower respondents at the Grand Forks seminar location indicated that Poncho Beta insecticidal seed treatment was their choice for springtail management during the 2023 growing season. That figure marked a significant (i.e., about 37%) increase in Poncho Beta use for springtail control when compared to the 2022 survey results. Most of the remaining reported insecticide use for springtail control by Grand Forks respondents involved applications of Counter 20G (17% of respondents) and Midac FC (12% of respondents). The remainder of reported insecticide use by Grand Forks attendees involved Mustang Maxx (4% of respondents).

Table 11. Insecticide use for *springtail* management in 2023

Location	Number of responses	Poncho Beta	Cruiser	NipsIt Inside	Midac FC	Mustang Maxx	Counter 20G	Other	None
		% of responses							
Fargo	14	29	0	0	7	0	14	0	50
Grafton	44	39	2	5	11	2	7	0	34
Grand Forks	77	52	0	0	12	4	17	0	16
Wahpeton	68	10	0	1	1	4	10	1	71
Totals	203	33	0	1	8	3	12	0	40

As presented in Table 12, an overall average of 72% of grower respondents surveyed at the Fargo, Grafton, Grand Forks, and Wahpeton seminar locations rated their insecticide performance for springtail management as good to excellent, and only 4% of respondents across all locations viewed their insecticide performance as poor. Satisfaction with springtail control efforts among Fargo attendees was somewhat unusual, as 38% rated their insecticide performance as good, but the majority (62%) were unsure of the success of their control practice.

Among grower respondents at the Grafton location, most (81%) viewed their springtail control as being either good or excellent, and no respondents assessed their results as being fair or poor. About 19% of Grafton respondents were unsure of the performance of their springtail control tool(s).

Similar to the results from Grafton, grower respondents at the Grand Forks seminar expressed a relatively high rate (80% of respondents) of satisfaction with their springtail control by rating it as good to excellent. However, 6% of Grand Forks respondents rated their springtail control as being fair to poor.

Survey results from the Wahpeton seminar location indicated that 54% of grower respondents viewed their springtail control as being either good or excellent. No respondents rated their control success as fair, bur 13% viewed it as poor. Additionally, 33% of Wahpeton respondents were uncertain about their springtail control success.

Table 12. *Satisfaction* with insecticide treatments for springtail management in 2023

Location	Number of responses	Excellent	Good	Fair	Poor	Unsure
		----------% of responses----------				
Fargo	14	0	38	0	0	62
Grafton	31	50	31	0	0	19
Grand Forks	62	24	56	2	4	14
Wahpeton	65	27	27	0	13	33
Totals	172	27	45	1	4	23

As was the case in 2022, Lygus bugs were not a major production problem for Red River Valley producers in 2023. This was clearly illustrated by the combined average of 94% of survey respondents at the Fargo, Grafton, Grand Forks, and Wahpeton winter grower seminars reporting that they did not use an insecticide in 2023 for Lygus bug control (Table 13).

Although insecticide use for Lygus bug management was very low, 8% of Fargo seminar attendees reported using Movento, a relatively new foliar insecticide, for Lygus bug management during the 2023 growing season. No other insecticides were reported as being used by Fargo seminar respondents for Lygus bug control in 2023. Similarly, at the Grafton seminar location, 3% of respondents indicated that they used Asana XL for Lygus bug control in 2023, and no other insecticides were reported as being used for that purpose.

Attendees of the Grand Forks grower seminar also reported low levels of insecticide use for Lygus bug control. A total of 7% of Grand Forks respondents indicated that they sprayed for Lygus bugs in 2023, with the majority (5% of attendees) reporting that they chose Mustang Maxx for this use and 2% of respondents indicating that they applied the newly registered insecticide Transform.

Wahpeton seminar survey results determined that insecticide use for Lygus bug management was also very low in that portion of the growing region. Respondents indicated that insecticide use for this purpose in 2023 was evenly split (3% each) between Mustang Maxx and Transform, with an additional 2% of producers indicating that they used an insecticide that was not included as a choice in the survey.

Table 13. Insecticide use for Lygus *bug* management in 2023

Location	Number of responses	Asana XL	Dibrom	Movento	Mustang Maxx	Transform	Other	None
		----------% of responses----------						
Fargo	12	0	0	8	0	0	0	92
Grafton	32	3	0	0	0	0	0	97
Grand Forks	63	0	0	0	5	2	0	93
Wahpeton	66	0	0	0	3	3	2	92
Totals	173	1	0	1	3	2	1	94

Survey results on satisfaction with insecticide performance for Lygus bug control are presented in Table 14. These results should be interpreted with a high degree of discretion because the exceptionally low frequency of insecticide use for that purpose resulted in a very small sample size. Overall, the results showed that, an average of 30% of respondents across all seminar locations viewed the success of their Lygus bug management insecticide in 2023 as good to excellent; however, a much greater proportion (62%) of them were unsure about the success of their efforts. Also, 8% of all seminar location respondents rated their Lygus bug control success as poor.

At the Fargo seminar location, 50% of respondents that used an insecticide for Lygus bug management in 2023 viewed its performance as good, and respondents (50%) were unsure about the effectiveness of their insecticide. All respondents at the Grafton grower seminar indicated that they were unsure about the success of the insecticide they used for managing Lygus bugs, however, as noted in Table 13, only 3% of the Grafton respondents used an insecticide for this purpose. At the Grand Forks location, 28% of respondents viewed their Lygus bug insecticide effectiveness as being either good or excellent, but 14% viewed it as poor and the remaining 58% were unsure. At the Wahpeton seminar, 33% of grower respondents assessed the performance of the insecticide they applied for Lygus bug control as excellent, but the remaining 67% were unsure regarding its effectiveness.

Table 14. *Satisfaction* with insecticide treatments for Lygus *bug* management in 2023

Location	Number of responses	Excellent	Good	Fair	Poor	Unsure
		----------% of responses----------				
Fargo	13	0	50	0	0	50
Grafton	32	0	0	0	0	100
Grand Forks	60	14	14	0	14	58
Wahpeton	64	33	0	0	0	67
Totals	169	15	15	0	8	62

For the second consecutive year, grasshoppers were problematic in 2023 for many Red River Valley sugarbeet producers; however, outbreaks were not as widespread as they had been during the 2021 growing season. Overall, 31% of all grower respondents at the Fargo, Grafton, Grand Forks, and Wahpeton grower seminars indicated that they used a foliar insecticide for grasshopper control in 2023 (Table 15). Mustang Maxx was the most widely used insecticide for grasshopper control in 2023, and it was applied to sugarbeet fields by 17% of all respondents at the four aforementioned 2024 winter grower seminars. An additional 6% of all survey respondents across all grower seminar locations indicated that they had used Asana XL for grasshopper control 2023.

A total of 32% of the Fargo grower seminar respondents reported that they had used an insecticide for grasshopper control in 2023. Survey responses indicated that insecticide use for this purpose was evenly split (8% each) between Asana XL, Mustang Maxx, and Vantacor, and an additional 8% of respondents indicated that they used an insecticide that was not included as a choice in this survey.

At the Grafton winter grower seminar, 22% of respondents indicated that they had used a foliar insecticide for grasshopper management in 2023. Of those producers that used an insecticide for this purpose, 73% applied Mustang Maxx, 14% used Asana XL, and an additional 14% of the respondents reported using an insecticide that was not offered as a choice in our survey.

The Grand Forks seminar survey results indicated that 30% of respondents used an insecticide to control grasshoppers in 2023. Of those respondents who used an insecticide for this purpose, 53% reported that they applied Mustang Maxx, and 17% used Asana XL. Additional insecticide use for grasshopper control was infrequent, but evenly split (7% each) among Lannate, Movento, and Vantacor. Also, 10% of producers that reported using an insecticide for grasshopper control indicated that they used an insecticide that was not included as a choice in the survey.

Reported insecticide use in 2023 for grasshopper management by Wahpeton grower seminar attendees was slightly higher than that reported at any of the other seminar locations. A total of 33% of all respondents at the Wahpeton seminar indicated that they had used an insecticide for grasshopper control in sugarbeet in 2023, and 64% of those respondents indicated that they used Mustang Maxx. Asana XL was reported as being applied to control grasshoppers in sugarbeet by 21% of those respondents, and an additional 3% reported using Vantacor for this purpose. Twelve percent of Wahpeton respondents that had used an insecticide for grasshopper control indicated that they chose to use an insecticide that was not included in our survey.

Table 15. Insecticide use for *grasshopper* management in 2023

Location	Number of responses	Asana XL	Lannate	Movento	Mustang Maxx	Vantacor	Other	None
		----------% of responses----------						
Fargo	13	8	0	0	8	8	8	68
Grafton	32	3	0	0	16	0	3	78
Grand Forks	61	5	2	2	16	2	3	70
Wahpeton	67	7	0	0	21	1	4	67
Totals	173	6	1	1	17	2	4	69

Good to excellent grasshopper control in 2023 was reported by 74% of all respondents that attended the four winter grower seminar locations (Table 16); however, 20% of all grower seminar respondents viewed their grasshopper control performance as being fair to poor. At the Fargo winter grower seminar, 67% of respondents rated their insecticide as having provided good to grasshopper control in 2023, but no respondents indicated that they viewed it as excellent. No Fargo seminar respondents that used an insecticide for grasshopper control in 2023 rated its performance as fair or poor.

Of the Grafton seminar respondents that applied an insecticide for grasshopper control in 2023, most (71%) viewed its performance as either good or excellent. Fourteen percent of survey respondents at the Grafton seminar location rated their insecticide performance for grasshopper management as fair. None of them rated their grasshopper insecticide performance as poor, but 14% of those that had used an insecticide for this purpose were unsure of the level of success achieved with the insecticide.

Results from the Grand Forks grower seminar location indicated that the majority (73%) of respondents viewed their insecticide performance in managing grasshopper infestations as being good to excellent, whereas 23% rated their grasshopper control as fair to poor. Six percent of Grand Forks respondents who applied an insecticide to manage grasshoppers were unsure of its success.

Survey results from the Wahpeton grower seminar were similar to those at the other locations. Seventy-seven percent of growers that used an insecticide for grasshopper control in 2023 viewed its performance as good to excellent. Twenty-three percent of Wahpeton attendees responded with the assessment that their insecticide program for grasshopper control was fair, but no respondents viewed their insecticide performance as being poor.

Table 16. *Satisfaction* with insecticide treatments for *grasshopper* management in 2023

Location	Number of responses	Excellent	Good	Fair	Poor	Unsure
		% of responses				
Fargo	13	0	67	0	0	33
Grafton	31	14	57	14	0	14
Grand Forks	59	6	67	17	6	6
Wahpeton	65	18	59	23	0	0
Totals	168	12	62	18	2	6

Attendees the 2024 winter sugarbeet grower seminars were asked about how their insecticide use for insect pest management compared to previous years. Overall, 64% of respondents at all (Fargo, Grafton, Grand Forks, and Wahpeton) seminar locations combined reported that their insecticide use in 2023 did not differ from that of the previous five years (Table 17). The most significant insecticide use change observed with this question was that 31% of Fargo seminar attendees reported an increase in insecticide usage in 2023 when compared to the previous five years. Similarly, 18% of respondents at both Grafton and Wahpeton also reported that their insecticide usage had increased in 2023 when compared to previous years. Increases in insecticide use by grower attendees of the Fargo, Grafton, and Grand Forks seminars could have been associated with producer responses to increasing intensity and geographic spread of sugarbeet root maggot populations, combined with several outbreaks of grasshoppers in 2023. The increased insecticide usage reported by Wahpeton seminar attendees was more likely a result of several outbreaks of sugarbeet webworm, beet armyworm, and grasshoppers during the 2023 growing season. Increased activity of several of those same pests motivated producers to increase their insecticide usage in 2022 as well.

Table 17. Insecticide use in sugarbeet during 2023 compared to the previous 5 years

Location	Number of responses	Increased	Decreased	No Change	No Insecticide Use
		% of responses			
Fargo	13	31	8	61	0
Grafton	34	18	18	62	2
Grand Forks	60	18	2	78	2
Wahpeton	65	12	17	54	17
Totals	172	17	11	64	8

Grower seminar attendees were also asked about their use of various information sources for making sugarbeet insect pest management decisions. Averaged across the four grower seminar locations, 25% of respondents indicated that they used a publicly available decision-making tool or information source for sugarbeet insect management decision making during the 2023 growing season (Table 18). An average of 72% of attendees indicated that they used alternative sources for making insect management decisions, and 3% of respondents reported that they did not rely on any of them. The most commonly used decision-making tools and information sources used by attendees for insect pest management in 2023, as averaged across locations, included sugar cooperative-generated cellular text alerts (10% of respondents), the Sugarbeet Production Guide (8% of respondents), and the NDSU Crop & Pest Report (7% of respondents). Pest management information source usage was varied slightly among surveyed locations in 2023, with respondents that attended the Grand Forks seminar being the most dominant users (35% of attendees) of available information resources, and Grafton attendees being the second-most common users (23% of attendees) of the information.

Table 18. Use of information sources for sugarbeet insect pest management decision making in 2023

Location	Number of Responses	NDSU Crop & Pest Report	Sugarbeet Production Guide	Cellular text alerts	Other	None
		% of responses				
Fargo	16	7	6	6	81	0
Grafton	38	10	3	10	74	3
Grand Forks	63	6	16	13	65	0
Wahpeton	70	7	4	9	74	6
Totals	187	7	8	10	72	3

Acknowledgement:

The authors greatly appreciate the valued and essential contributions of responses to this survey by the sugarbeet producers that attended the winter sugarbeet grower seminars.