

# SUGARBEET ROOT MAGGOT FLY MONITORING IN THE RED RIVER VALLEY IN 2023

Mark A. Boetel, Professor

Department of Entomology, North Dakota State University, Fargo, ND

Sugarbeet root maggot (SBRM), *Tetanops myopaeformis* (Röder), fly activity was monitored at 124 grower field sites throughout the Red River Valley (RRV) during the 2023 growing season. This effort was carried out as a collaborative effort between NDSU Sugarbeet Entomology personnel and American Crystal Sugar Company.

Sugarbeet root maggot fly activity, as averaged throughout the RRV, was slightly lower during the 2023 growing season when compared to that recorded during the two previous growing seasons (Figure 1). However, the SBRM fly levels observed in 2023 were the third-highest recorded in the past 17 years (i.e., since the expanded fly monitoring program began in 2007). The most intense SBRM fly activity levels in 2023 were observed in the central and northern Red River Valley, which is somewhat typical of what is annually observed on the distribution of this pest within the growing area. This suggests that control efforts between 2022 and 2023 had been somewhat successful in reducing overall population levels for many producers in those areas.

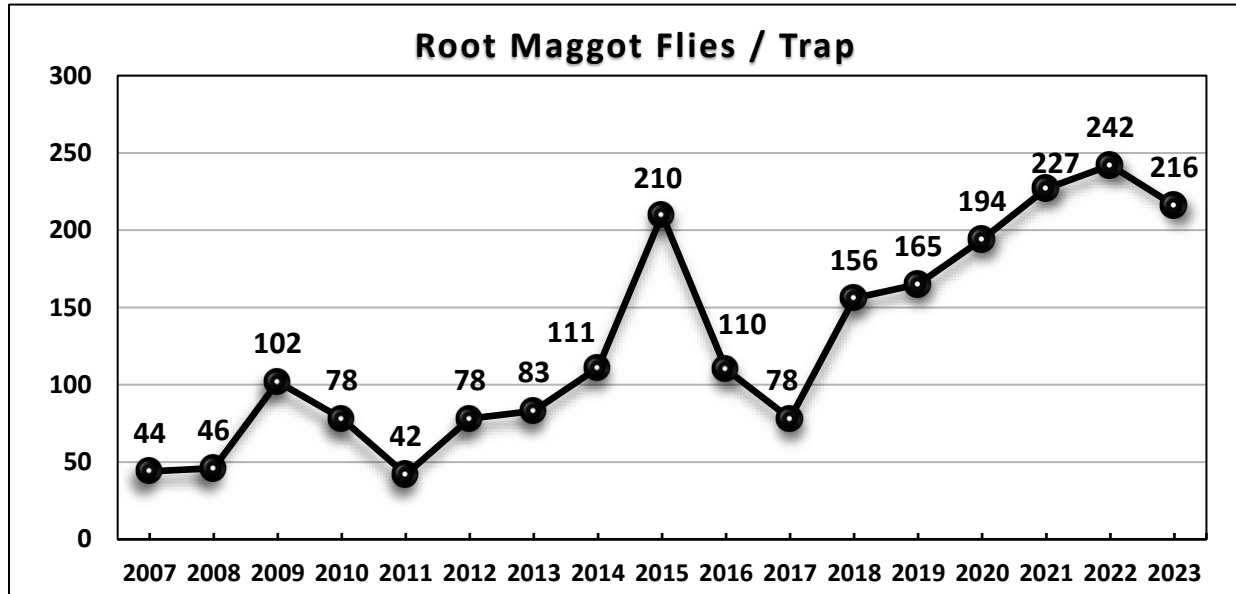
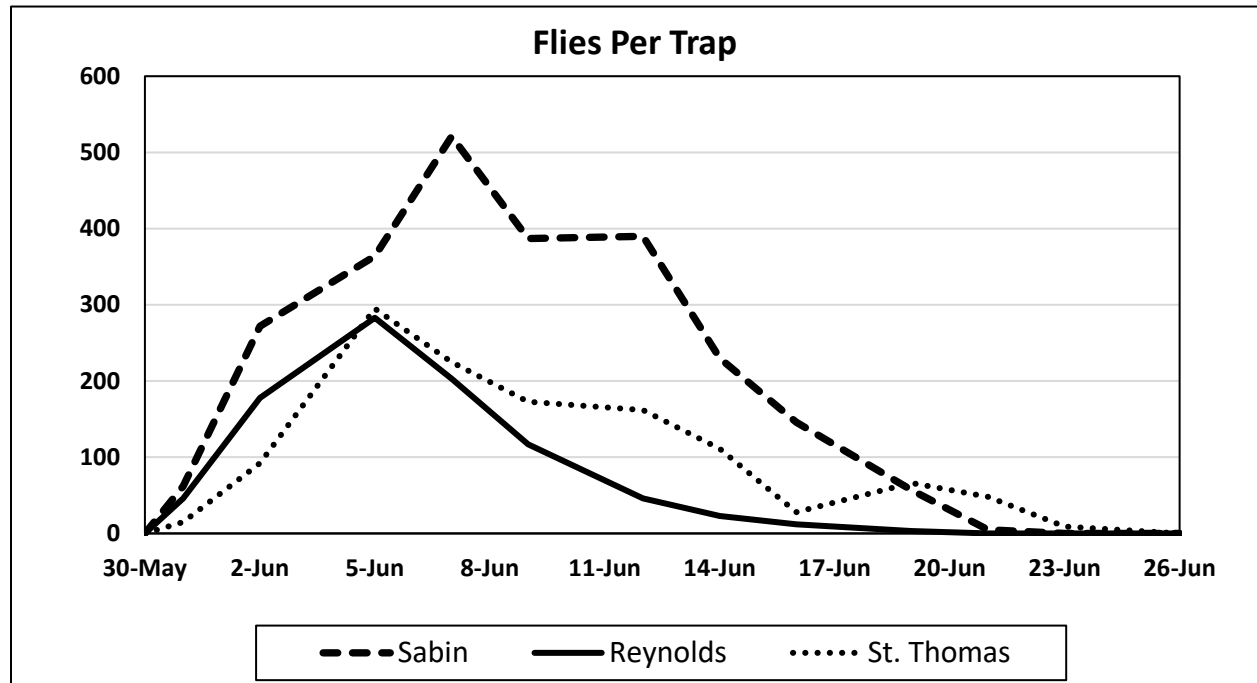


Figure 1. Yearly averages of sugarbeet root maggot flies captured on sticky-stake traps (Blickenstaff and Peckenpaugh, 1976) in the Red River Valley from 2007 to 2023.

High to severe levels of SBRM fly activity (i.e., cumulative capture of at least 200 flies per sticky stake) were observed in 2023 in fields near the following communities (listed in alphabetical order; cumulative flies per stake in parentheses): Auburn (597), Backoo (215), Bathgate (282), Bowesmont (388), Buxton (230), Cavalier (346), Crystal (431), Drayton (279), Hensel (257), Oakwood (476), Reynolds (456), St. Thomas (612), Thompson (409), Veseleyville (319), and Voss, ND (534), and Ada (520), Argyle (268), Climax (211), Crookston (469), Donaldson (222), East Grand Forks (420), Oslo (357), Sabin (1,217), Stephen (284), and Warren, MN (279).

Moderately high levels of activity were also recorded near Forest River (89), Glasston (197), Grand Forks (177), Hamilton (158), Manvel (51), Merrifield (94), Minto, ND (182), as well as Angus (195), Borup (171), Donaldson (165), Eldred (120), Euclid (165), Fisher (163), Kennedy (189), and Tabor, MN (177). Fly activity was either economically insignificant or undetectable at other monitored locations.

Figure 2 presents sugarbeet root maggot fly monitoring results from three representative sites (i.e., Sabin, MN; and Reynolds and St. Thomas, ND) during the 2023 growing season. Adult fly emergence started at the beginning of June at all three sites, irrespective of latitude. Although emergence onset was slightly later than historical averages (emergence typically begins within the last seven to ten days in May), flight activity peaks in 2023 occurred between June 6 and 7, which was about one week earlier than the 15-year average date of June 13 for the production area as a whole.



**Fig. 2. Sugarbeet root maggot flies captured on sticky-stake traps at selected Red River Valley sites, 2023.**

Between late-August and September of 2023, after which most SBRM larval feeding had ceased, 40 roots in 33 of the fly monitoring field sites were rated for root maggot larval feeding injury in accordance with the 0-9 scale of Campbell et al. (2000) to assess whether fly outbreaks and larval infestations were managed effectively. Six additional fields that were not part of the fly monitoring program were also rated to provide additional data points. The resulting data was subsequently overlaid with corresponding fly count data to develop the root maggot risk forecast map for the subsequent growing season (the SBRM risk forecast for next year is presented in the report that immediately follows this one).

Root maggot feeding injury, averaged across all RRV fields that exceeded the generalized economic threshold (43 cumulative flies per trap), was 1.85 on the 0 to 9 rating scale. That reflected a near doubling in SBRM feeding injury when compared to that recorded in the previous growing season. A list of RRV locations where the highest average root injury ratings were observed is presented in Table 1. Cumulative SBRM fly activity in those fields ranged from 284 flies/trap near Stephen, MN to a severe level of 1,217 flies/trap near Sabin, MN. The average root maggot larval feeding injury recorded for those fields ranged from a moderate rating of 2.8 at Stephen to a severe level of 6.9 at Auburn, which suggests that producers managing those fields had varying levels of success in controlling the SBRM infestations that developed in them. Other fields monitored for fly activity that had a combination of high fly activity and at least moderate SBRM feeding injury in 2023 included sites near Crystal, ND (431 cumulative flies/trap; average root rating = 3.9) and Veseleyville, ND (319 cumulative flies/trap; average root rating = 2.9). It should also be noted that the Cavalier location sustained high SBRM feeding injury as well, which suggests high risk for damaging root maggot infestations in that area for the 2024 growing season. Other areas within the monitoring network likely also sustained moderate to even high SBRM feeding injury; however, it was logistically impossible to conduct injury ratings at all fly monitoring locations.

Nearest City	Township	State	Flies/stake <sup>a</sup>	Average Root Injury Rating <sup>b</sup>
Auburn	Martin	ND	N/A <sup>c</sup>	6.9
Cavalier	Cavalier N.	ND	N/A	5.0
Crystal	Elora	ND	431	3.9
Sabin	Elmwood	MN	1,217	3.7
St. Thomas	St. Thomas S.	ND	N/A	3.4
Veseleyville	Ops	ND	319	2.9
Stephen	Wanger	ND	284	2.8

<sup>a</sup>Cumulative number of flies captured per sticky stake trap throughout growing season.

<sup>b</sup>Sugarbeet root maggot feeding injury rating based on the 0 to 9 root injury rating scale (0 = no scarring, and 9 = over ¾ of the root surface blackened by scarring or dead beet) of Campbell et al. (2000).

<sup>c</sup>N/A: no fly activity monitoring conducted.

Although the collective results from root injury ratings of grower fields conducted in 2023 suggest that RRV sugarbeet growers were somewhat successful in managing the sugarbeet root maggot, continued vigilance and aggressive pest management practices will likely be necessary in the coming years. Careful monitoring of fly activity in moderate- and high-risk areas (see Forecast Map [Fig. 1] in subsequent report) will help prevent economic loss in 2024. Vigilant monitoring and effective SBRM management on an individual-field basis by sugarbeet producers could also help prevent significant population increases from one year to another, because even moderate levels of root maggot survival in one year can quickly develop into economically damaging infestations in the subsequent growing season. That assertion is substantiated by the significant increase in SBRM fly activity that occurred in the Sabin area between 2021 and 2023.

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