

SUGARBEET ROOT MAGGOT FLY MONITORING IN THE RED RIVER VALLEY IN 2020

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Sugarbeet root maggot (SBRM), *Tetanops myopaeformis* (Röder), fly activity was monitored at 150 grower field sites throughout the Red River Valley during the 2019 growing season. This effort was carried out as a collaborative effort between the NDSU Department of Entomology and American Crystal Sugar Company..

For the third consecutive year, root maggot fly activity was at exceptionally high levels throughout much of the Valley. Fly activity levels in 2020 were the second-highest recorded in the past 14 years for the growing area (Figure 1). This suggests that control efforts between 2017 and 2020 were unsuccessful in reducing overall population levels for many producers.

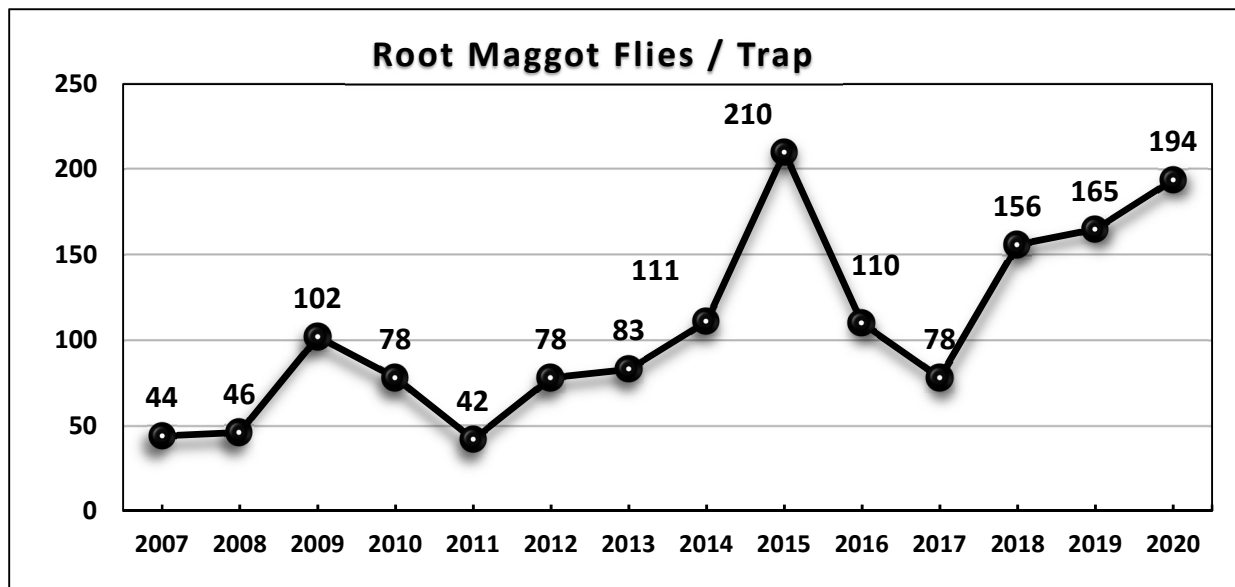
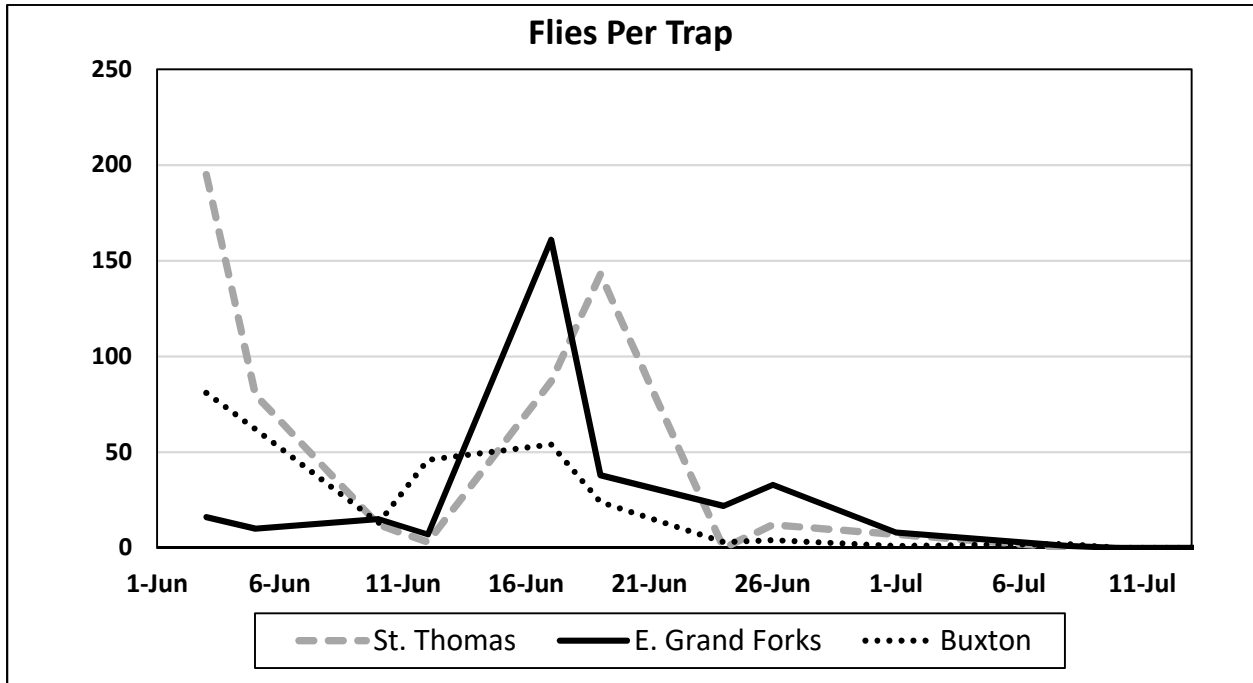


Figure 1. Yearly averages of sugarbeet root maggot flies captured on sticky-stake traps (Blickenstaff and Peckenpaugh, 1976) in the Red River Valley from 2007 to 2020.

The highest levels of SBRM fly activity observed in 2020 occurred near Auburn, Bathgate, Buxton, Cavalier, Crystal, Drayton, Glasston, Grafton, Hamilton, Hoople, Leroy, Reynolds, St. Thomas, and Thompson, ND, as well as near Argyle, Crookston, Donaldson, East Grand Forks, Fisher, Kennedy, Stephen, and Warren, MN. Moderately high levels of activity were recorded near Emerado, Forest River, Grand Forks, Merrifield, Minto, Neche, and Voss, ND, and near Ada, Angus, Sabin, and Sherack, MN. Fly activity in most of the southern portion of the Valley remained at relatively low or undetectable levels throughout the growing season, which has been the case in that part of the growing area for several years.

Figure 2 presents SBRM fly monitoring results from three representative sites (i.e., St. Thomas and Thompson, ND, and East Grand Forks, MN) during the 2020 growing season. Fly emergence began unusually early in northern parts of the Valley, with the first occurrences of high fly activity being observed during the first week of June in the areas surrounding St. Thomas and East Grand Forks. That is about one week ahead of the historical average peak fly activity date for these growing areas. The main peaks in activity for much of the remaining monitoring sites occurred on or within one or two days of June 17. The occurrence of two peaks in one growing season is somewhat rare. It is hoped that the early emergence observed during the springs of both 2018 and 2020



were just anomalies resulting from unseasonably warm early spring temperatures, and not the onset of a developing new “normal” for SBRM fly activity in the region.

Fig. 2. Sugarbeet root maggot flies captured on sticky-stake traps at selected Red River Valley sites, 2020.

In late-summer, after the larval feeding period had ended, 58 of the fly monitoring sites were rated for sugarbeet root maggot 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. The resulting data is subsequently overlaid with corresponding fly count data to develop a 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 2.14 on the 0 to 9 rating scale. That amounted to a 128% increase over the same figure recorded in 2017. 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 70 flies/trap near Forest River, ND to 634 flies/trap near Crystal, ND.

Table 1. Sugarbeet root maggot fly activity and larval feeding injury in Red River Valley commercial sugarbeet fields where injury exceeded 2.5, 2020				
Nearest City	Township	State	Flies/stake	Average Root Injury Rating^a
Crystal	Crystal	ND	225	4.10
Crystal	Elora	ND	364	3.78
Cavalier	S. Cavalier	ND	237	3.48
Hoople	Dundee	ND	194.5	3.45
Hamilton	Hamilton	ND	88	3.38
St. Thomas	Lodema	ND	172.5	3.30
Grafton	Martin	ND	280	3.28
St. Thomas	S. St. Thomas	ND	634	3.20
Buxton	Belmont	ND	377	2.98
Bathgate	Bathgate	ND	252	2.85
Forest River	Ops	ND	70	2.70
Glasston	N. Midland	ND	476	2.55

^aSugarbeet 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).

The comparatively high root injury ratings observed at the locations listed in Table 1 suggest that control practices in those areas were not as successful as growers may have hoped. As also indicated in Table 1, average root injury ratings in fields in eight townships near Cavalier, Crystal, Grafton, Hamilton, Hoople, and St. Thomas, ND ranged between 3.20 and 4.1 on the 0 to 9 scale. Also, average root injury ratings in four additional fields in the vicinity of Bathgate, Buxton, Forest River, and Glasston, ND exceeded 2.5. As noted in 2019, this is very concerning because it is rare for SBRM feeding injury ratings in grower-managed fields to exceed 3.0.

As such, the risk of damaging SBRM infestations in those areas for the 2021 growing season will be high. Careful monitoring of fly activity in moderate- and high-risk areas (see Forecast Map [Fig. 1] in subsequent report) will be critical to preventing economic loss in 2021. 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 be sufficient to result in economically damaging infestations in the subsequent growing season.

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