SUGARBEET ROOT MAGGOT FLY MONITORING IN THE RED RIVER VALLEY IN 2019

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In a cooperative effort between the NDSU Department of Entomology and American Crystal Sugar Company, sugarbeet root maggot (SBRM), *Tetanops myopaeformis* (Röder), fly activity was monitored at 119 grower field sites throughout the Red River Valley during the 2019 growing season.

For the second consecutive year, root maggot fly activity was at exceptionally high levels throughout much of the Valley. Fly activity levels in 2019 were the second-highest recorded in the past 13 years for the growing area (Figure 1). This suggests that control efforts between 2017 and 2019 were unsuccessful in reducing overall population levels for many producers.

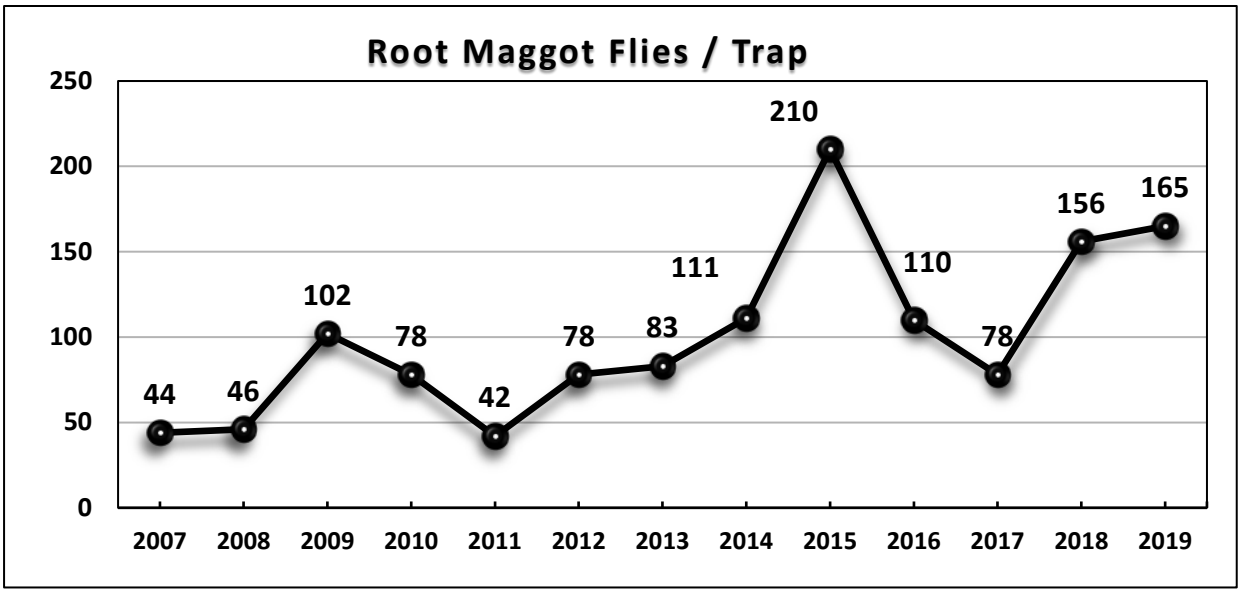

Figure 1. Yearly averages of sugarbeet root maggot flies captured on sticky-stake traps (Blickenstaff and Peckenpaugh, 1976) in the Red River Valley from 2007 to 2019.

The highest levels of SBRM fly activity observed in 2019 occurred near Auburn, Bathgate, Buxton, Cavalier, Crystal, Glasston, Grand Forks, Hamilton, Merrifield, Reynolds, St. Thomas, Thompson, and Walhalla, ND, as well as near Argyle, Crookston, Donaldson, East Grand Forks, Eldred, Fisher, and Stephen, MN. Moderately high levels of activity were recorded near Drayton, Forest River, Merrifield, Nash, and Reynolds, ND, and near Ada and Warren, 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 2019 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 2019 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.

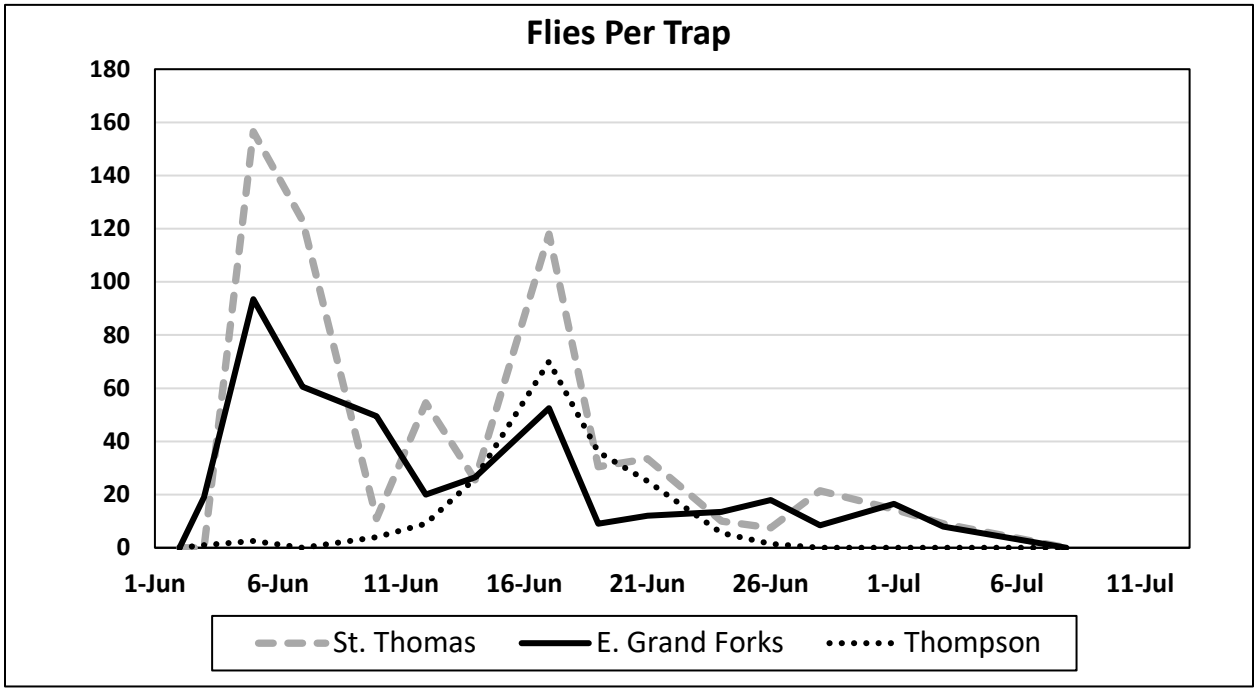

Fig. 2. Sugarbeet root maggot flies captured on sticky-stake traps at selected sites in the Red River Valley.

In late-summer, after the larval feeding period had ended, 48 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 forecast for next year is presented in the report immediately following this one).

Root maggot feeding injury, averaged across all RRV fields that exceeded the generalized economic threshold (43 cumulative flies per trap), was 2.06 on the 0 to 9 scale. That amounted to a 117% increase over the same figure recorded for 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 50 flies/trap near Crookston, MN to 670 flies/trap near Crystal, ND.

The comparatively high root injury ratings observed at the locations listed in Table 1 provide more evidence that control efforts in those areas were not as successful as growers may have hoped. As indicated in the table, root injury ratings in fields near Argyle, Auburn, Cavalier, Crystal, Donaldson, East Grand Forks, Glasston, St. Thomas, and Walhalla, averaged between 3.28 and 5.74. Also, root injury levels in four additional fields in the vicinity of Cavalier, Crookston, and Thompson averaged at or above 2.5. This is alarming because it is somewhat rare for root maggot feeding injury ratings in grower-managed fields to exceed 3.0.

As such, the risk of damaging SBRM infestations in those areas for the 2020 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 2020. 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.

Table 1. Sugarbeet root maggot feeding injury in several Red River Valley sugarbeet fields where injury exceeded 2.5, 2019

Nearest City	Township	State	Flies/stake	Average Root Injury Rating[a]
E. Grand Forks	Sullivan	ND	145	5.74
Auburn	Martin	ND	130	4.74
Argyle	Alma	MN	651	4.54
Glasston	Lodema	ND	236	4.33
Walhalla	Advance	ND	161	4.10
St. Thomas	South Cavalier	ND	529	3.92
St. Thomas	South St. Thomas	ND	368	3.67
Cavalier	North Cavalier	ND	191	3.59
Crystal	Elora	ND	158	3.56
St Thomas	South St. Thomas	ND	615	3.51
Donaldson	Spring Brook	MN	154	3.31
St. Thomas	North St. Thomas	ND	112	3.31
Crystal	Elora	ND	670	3.28
Crookston	Crookston	MN	433	2.82
Cavalier	North Cavalier	ND	216	2.72
Thompson	Americus	ND	181	2.62
Crookston	Fairfax	MN	50	2.56

[a]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).

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