SUGARBEET ROOT MAGGOT FLY ACTIVITY IN THE RED RIVER VALLEY IN 2018

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Sugarbeet root maggot (SBRM), *Tetanops myopaeformis* (Röder), fly activity was monitored in multiple grower field sites throughout the Red River Valley (RRV) during the 2018 growing season. The project was jointly funded by the Sugarbeet Research & Education Board of Minnesota and North Dakota and American Crystal Sugar Company. Thirty-four fields were monitored by NDSU, and an additional 47 fields were monitored by agriculturists from American Crystal Sugar Company and the MinnDak Farmers Cooperative.

The Valley-wide average in fly activity for the growing area, 156 cumulative flies throughout the season per trap, was the second-highest in the past 12 years (Figure 1). This suggests that crop advisors and growers should plan to be very vigilant in monitoring fly activity and forthcoming associated media reports to address the anticipated root maggot fly population increases in 2019.

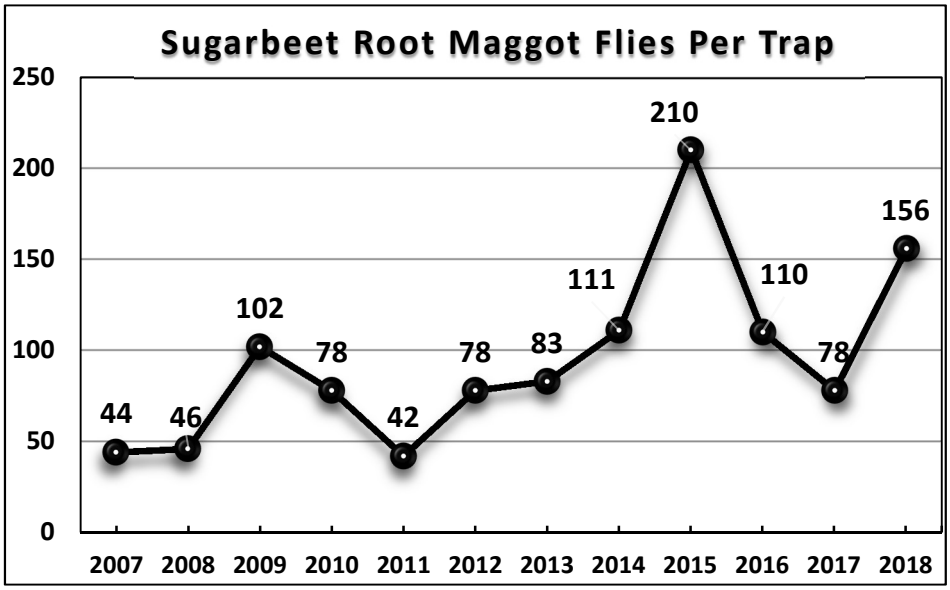

Figure 1. Yearly average capture of sugarbeet root maggot flies in the Red River Valley using sticky-stake traps (Blickenstaff and Peckenpaugh, 1976).

Sugarbeet root maggot fly emergence began unusually early in 2018, and continued at alarmingly high rates for about three weeks. The first flush of high fly activity occurred at several monitoring sites in late May, nearly 3 weeks ahead of the historical average peak fly date. This was the earliest 1st peak in fly activity recorded in the past 20+ years, and it was followed by two additional peaks at multiple sites. The occurrence of two peaks in one growing season is relatively infrequent, but having three peaks in a single season is extremely rare. It is hoped that this was simply an anomaly, and not the onset of a developing new "normal" for SBRM fly activity in the RRV.

The highest levels of SBRM fly activity occurred near the following communities (respective cumulative fly counts per trap for the season within parentheses, in descending order): East Grand Forks, MN (751), St. Thomas, ND (620), Thompson, ND (485), Grand Forks, ND (414), Argyle, MN (380), Drayton, ND (344), Crookston, MN (339), and Fisher, MN (333). Moderately high levels of activity were recorded in 2018 near Cavalier, ND (233), Bowesmont, ND (225), Auburn, ND (222), Bathgate, ND (218), Buxton, ND (182), and Eldred,

MN (156). Fly activity in the southern portion of the Valley remained at low to undetectable levels throughout the growing season.

Figure 2 presents SBRM fly monitoring results from three representative sites (i.e., St. Thomas (S. St. Thomas Township [TWP]), ND, East Grand Forks [Grand Forks TWP], MN, and Thompson (Brenna TWP), ND. The first captures of flies began almost immediately after sticky stakes were deployed (May 23), with relatively high counts being recorded at the first check of stakes on May 25. Significant increases in fly activity occurred during the last couple of days in May, with an additional peak in activity occurring between June 5th and 8th at several sites. Another, albeit, less-significant spike also occurred between June 23 and June 25 at some locations.

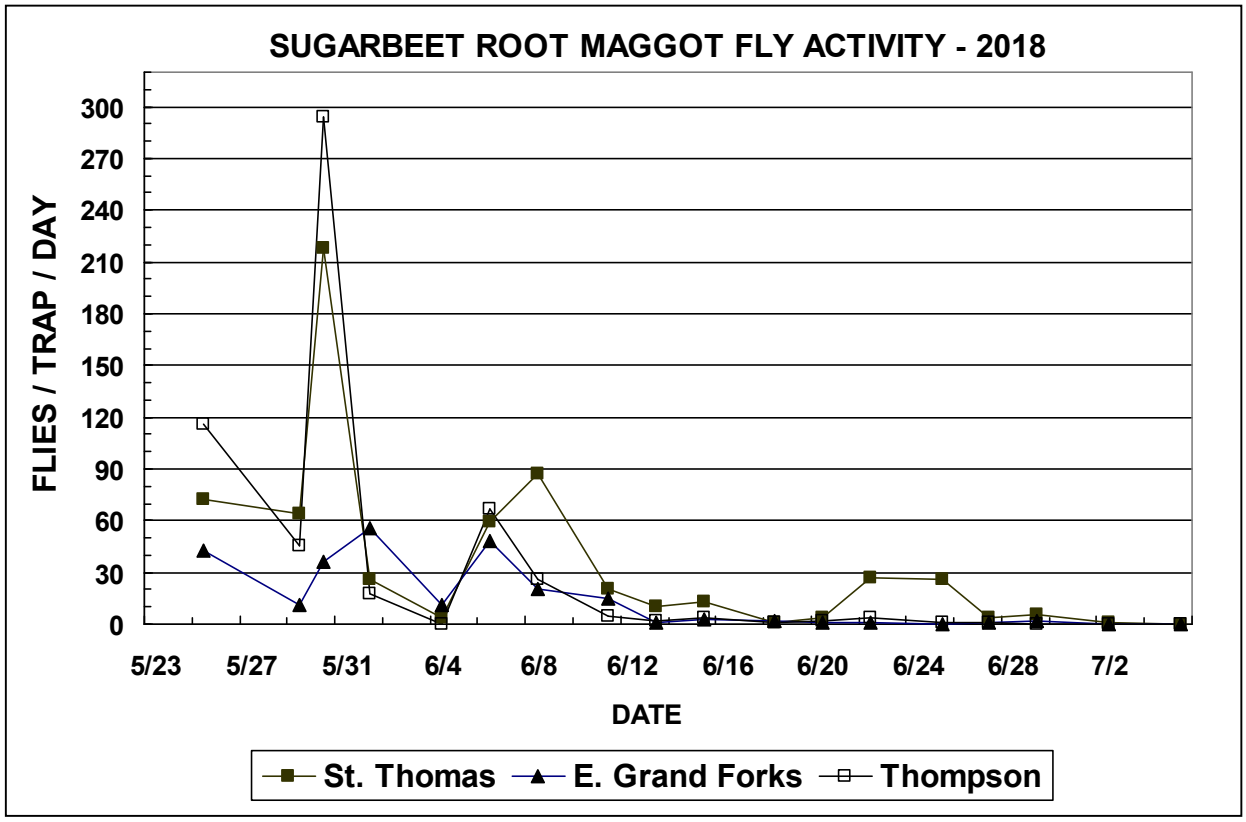

Fig. 2. Sugarbeet root maggot flies captured on sticky-stake traps at selected sites in the Red River Valley.

In late-summer, after the larval feeding period had ended, 56 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). This is carried out on an annual basis as a means of determining whether fly outbreaks and larval infestations were managed effectively. The resulting data is 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 that follows this one).

Root maggot larval feeding injury in most fields was greater than that observed in the past couple of years. The level of root-feeding injury, averaged across all RRV fields that exceeded the generalized economic threshold (43 cumulative flies per trap), was 1.88 on the 0 to 9 scale. That was twice as high as the average feeding injury recorded for above-threshold fields last year (0.94). 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 61 flies/trap near Euclid, MN to 485 flies/trap near Thompson, ND.

The comparatively high root injury ratings observed at the locations listed in Table 1 suggests that control efforts in those areas were not as successful as growers may have been hoped. As indicated in the table, root injury ratings in fields near St. Thomas, Thompson, Grand Forks, Cavalier, Reynolds, and Crookston averaged between 3.0 and 5.1, and the remainder were at or above 2.5. This is alarming because it is somewhat rare for root maggot feeding injury ratings in grower fields to exceed 3.0.

Table 1. Sugarbeet root maggot feeding injury in several Red River Valley sugarbeet fields where injury exceeded 2.5, 2018

Nearest City	Township	State	Flies/stake	Average Root Injury Rating[a]
St Thomas	S. Cavalier	ND	228	5.1
St Thomas	S. Midland	ND	no count	4.1
Thompson	Brenna	ND	485	3.8
Grand Forks	Grand Forks	ND	123	3.6
Cavalier	N. Cavalier	ND	233	3.5
Reynolds	Bentru	ND	93	3.2
Grand Forks	Allendale	ND	414	3.1
Crookston	Crookston	MN	339	3.0
Euclid	Euclid	MN	61	2.9
Argyle	Wanger	MN	380	2.8
Bowesmont	Lincoln	ND	225	2.8
Auburn	Martin	ND	222	2.8
St Thomas	Lodema	ND	149	2.6
Thompson	Americus	ND	143	2.5
Crookston	Crookston	MN	255	2.5

[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).

As such, risk of damaging SBRM infestations in those areas for the 2019 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 2019. 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 following year.

Acknowledgments:

The authors extend appreciation to the following sugar cooperative agriculturists for monitoring several additional fields for sugarbeet root maggot fly activity (in alphabetical order): Mike Doeden, Tyler Driscoll, Curtis Funk, Tom Hermann, Austin Holy, Bob Joerger, Holly Kowalski, Brock Larson, Terry Lunde, Chris Motteberg, Travis Pederson, John Samdahl, Dan Vagle, and Chad Wheeler. Thanks are also due to the following NDSU summer aides for providing assistance with fly monitoring activities: Juliana Hanson, Clara Jastram, Rachel Stevens, Claire Stoltenow, Kenan Stoltenow. We also thank the Sugarbeet Research and Education Board of Minnesota and North Dakota, and American Crystal Sugar Company for providing significant funding for this project. This work was also partially supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, Hatch project accession number 1012990.

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