

TARNISHED PLANT BUG ABUNDANCE AND ACTIVITY IN RED RIVER VALLEY CROPPING SYSTEMS

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Introduction:

Populations of the tarnished plant bug (TPB), *Lygus lineolaris*, also commonly referred to as the Lygus bug, have frequently reached alarming levels in the Red River Valley (RRV) during the past three years. The insect has a broad host plant range that includes many of the crop and weed species common to the RRV and is believed to be an economic threat to several crops. It prefers feeding on reproductive and meristematic regions of plants such as flowers, seeds, and growing points. The TPB feeds by inserting its piercing/sucking mouthparts into the plant, injecting digestive enzymes that breakdown plant cells, then consuming the resulting matter. Adult TPB's overwinter among plant debris. There are believed to be three generations per year, with adults and nymphs usually present concurrently. The TPB has 5 immature stages, all of which feed on plant material.

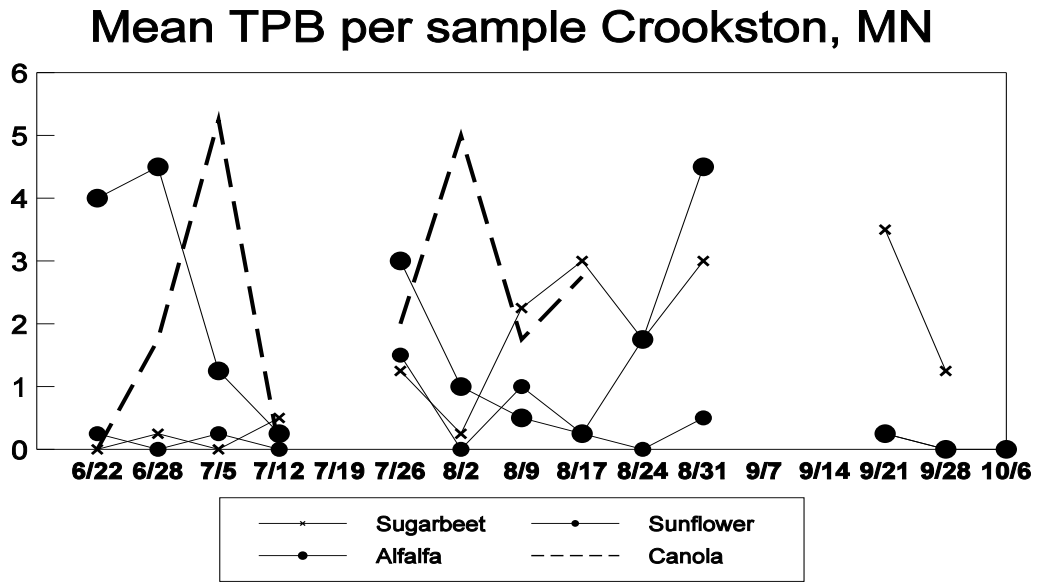
Materials & Methods:

In this experiment, TPB populations were monitored at two locations (Page, ND and Crookston, MN) in the Red River Valley. An area was selected within each location with four suspected host and reservoir crops in close proximity to each other. Sugarbeet, sunflower, alfalfa, canola, and soybean were monitored. Once a site was selected 4 zones were established in each field. Each habitat was sampled weekly from the onset of TPB activity to the end of the growing season. Sampling methods were developed for each crop and consisted of the following (1) A leaf blower/vacuum was modified into an insect vac for sampling in sugarbeet, the vacuum was moved in a circular motion through the foliage then placed directly above the crown for five seconds (20 plants per sampling); (2) The heads of sunflower plants (10) were tapped four times into a funnel that flowed into a sample bag. Alfalfa, canola, and soybean were sampled using a sweep net with 10 180-degree sweeps being taken in each of the four zones. The specific growth stage of the crop was recorded throughout the sampling period along with any other information that could be relevant to furthering our understanding of the biology of this insect in RRV cropping systems.

Results & Discussion:

Our trapping results are presented graphically in Figures 1 and 2. Since different sampling methods were used for the respective habitats, direct comparisons between individual crops should not be made. It is useful however, to rather look at the line of a particular crop in relation to concurrent events or changes in the line of another crop. There was an increase of TPB when a crop started to flower, then a decrease when a reservoir host habitat plant started to senesce or was harvested (i.e., canola or alfalfa). For example, the July 11 sample in alfalfa was high while the growth stage of the crop was at 10% flowering; however, the next week the alfalfa was swathed and the TPB captures decreased dramatically. Alfalfa can act as a reservoir habitat because the plants are continually producing structures of high cellular activity. Sugarbeet is a vegetative crop in the Red River Valley. In our study, heightened TPB activity in sugarbeet was observed

after
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 canola
 and
 sunflower
 fields
 were
 maturated
 in
 mid-August
 appears
 to



be a typical time for increased TPB activity in sugarbeet. Field monitoring areas of past TPB infestations should be initiated during the first week in August.

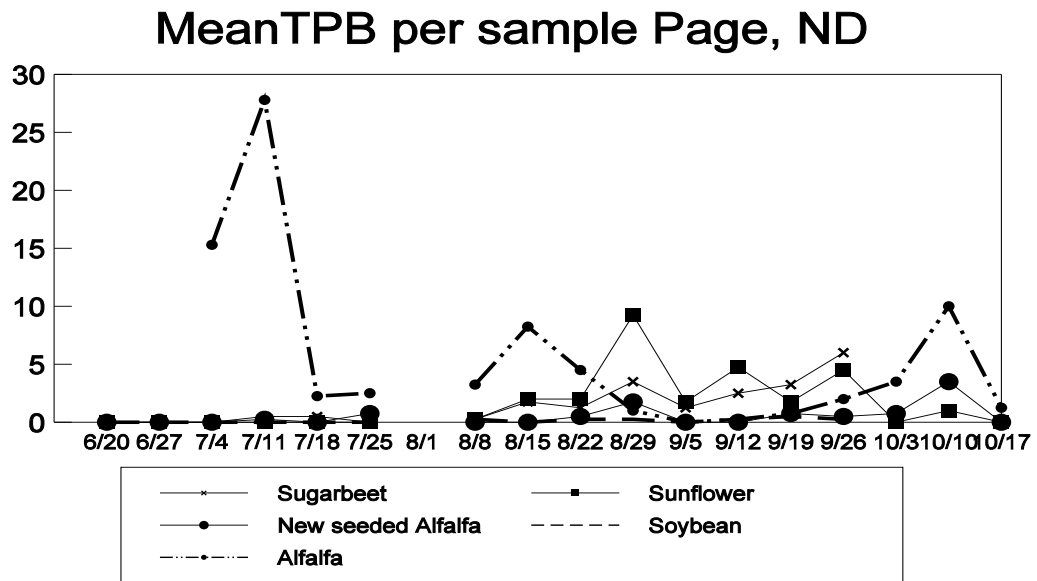


Figure 1. Abundance of TPB (adults and nymphs) in various host plant habitats, Crookston, MN, 2001.
 Note: A break in the line denotes a missed sampling date due to weather conditions.

Figure 2. Abundance of TPB (adults and nymphs) in various host plant habitats, Page, ND, 2001.
Note: A break in the line denotes a missed sampling date due to weather conditions.