

Natural enemies crash soybean aphids in East Lansing study

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Entomology Masters student Tyler Fox is conducting a study in East Lansing, Michigan to determine the impact of predators on soybean aphid (SBA) populations. The field was at V4 to V6 at the time the test was initiated on June 26 and held a natural population of SBA ranging from 7 to 141 aphids per soybean tip (emerging leaf buds + first fully opened leaf). Four treatments were established to exclude 1) all predators, 2) no predators (open), 3) ground dwelling predators or 4) foliar predators.

The most common predators ([see photos](#)) in these trials were lady beetles, primarily the multi-colored Asian lady beetle, minute pirate bugs, syrphid or hover fly larvae and green lacewing larvae. As many as 46 lady beetle larvae were found per meter square in some plots and immature minute pirate bugs (nymphs) were very abundant in all plots, averaging two nymphs on every three soybean tips on July 6. Where predators were completely excluded, aphid density *increased* by an average 25 percent in ten days, while aphid numbers **decreased** an average of 66 to 86 percent in plots where predators had partial or complete access to aphids. An unidentified disease of SBA also contributed to these declines.

Overall, from June 26 to July 6, the combination of predators and disease reduced the aphid population in this field from an average of 42 aphids per tip to five aphids per tip (an 88 percent decrease). We do not know if this phenomenon will be repeated in other parts of the state, but producers may want to determine if natural enemies are present before making decisions regarding the need for SBA control. Lady beetle adults are very mobile and will readily find heavily infested plants and lay eggs there. Because they may then move on, lady beetle adults may appear uncommon (about 0.5 to 1.0 per meter square) even where they are abundant enough to cause serious impacts on SBA populations. A more reliable indicator is the presence of lady beetle larvae, which look like little blue-black alligators, or eggs (orange football-shaped eggs in small clusters) on the leaves and stems of soybean. Similarly, adult minute pirate bugs are rather uncommon but the reddish-brown nymphs, while small (1/16-1/8 inch long), are relatively easy to find in the tips of soybean using a hand lens. Diseased aphids die on the plant in large numbers and appear as dark brown to black specks (shriveled carcasses) on stems petioles and leaves ([see photo](#)).

At this point, it is too early to make definitive statements about how many predators would be enough to suppress an SBA infestation. Under our conditions, plots with increasing aphid densities tended to have overall predator densities of less than two per meter square while those plots with eight or more predators per meter square were associated with strongly decreasing aphid densities. The presence of the disease makes interpretation of this result very difficult as we suspect disease and predators could interact on important ways. We will pass on additional results as we learn more from these studies.