

Aphid Suction Trap Network

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Introduction

The Suction Trap Network (STN) is a set of suction traps currently located in Illinois, Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Missouri, Nebraska, and Wisconsin. In 2020, the STN did not stop because of Coronavirus Disease 2019 (COVID-19). The objective of the STN is to monitor aphids of agricultural interest, to detect invasive species, to track the phenology of soybean and Eastern flower thrips (vectors of Soybean Vein Necrosis Virus), and to count potato leaf hopper, pirate minute bugs, hover flies, and flying ants.

Materials and Methods

The suction traps located in Iowa are at Ames, Kanawha, Nashua, and Sutherland, supervised by Erin Hodgson, Matthew Schnabel, Kenneth Pecinovsky, and Terry Tuttle, respectively. In 2020, the suction traps were started May 17 and the first collection was done May 22. The last suction trap collections were October 23. The weekly samples from the suction traps were sent to the USDA Laboratory in Urbana. The insects targeted were identified by Doris Lagos-Kutz, and the whole samples (not only the insects targeted) were stored in 95 percent ethanol at -20°C.

Results and Discussion

The flight activity of the total number of aphids collected from 2016 through 2020 varied from one year to another for all the

locations, except for Ames, which had a lower density and species diversity of aphids (Table 1 and Figure 1). The aphid density is normally associated with temperature changes, precipitation, and migration patterns consisting of either summer (within or outside the fields) and fall migration (from summer to winter or primary host plant). Abundant aphid pest species for all locations in Iowa included the bird cherry-oat aphid, *Rhopalosiphum padi*, and the soybean aphid, *Aphis glycines* (numbers considerably decreased in 2020).

The eight most abundant aphid species and weekly aphid counts are shown in Figure 2. In Figure 3, the seasonal population dynamics of soybean and Eastern flower thrips indicated that in 2020 the soybean thrips were more abundant than Eastern flower thrips, mostly in Kanawha and Sutherland, with peaks occurring in the middle of August and the first week of October.

The suction trap data from all the states and publications that used data from the suction trap samples can be found at <https://suctiontrapnetwork.org>, which is supported by University of Georgia and the Bugwood Center. In this website, the data per location and for the years of 2018 to 2020 are presented.

Acknowledgements

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Table 1. Species richness of aphids (number of species) collected from suction traps located in Iowa from 2016 through 2020.

Suction trap locations	2016	2017	2018	2019	2020
Ames	3.332	3.296	3.045	1.946	2.485
Kanawha	3.784	3.970	3.526	3.761	3.871
Nashua	3.989	3.989	3.497	3.434	3.784
Sutherland	4.025	3.989	3.611	3.970	3.912

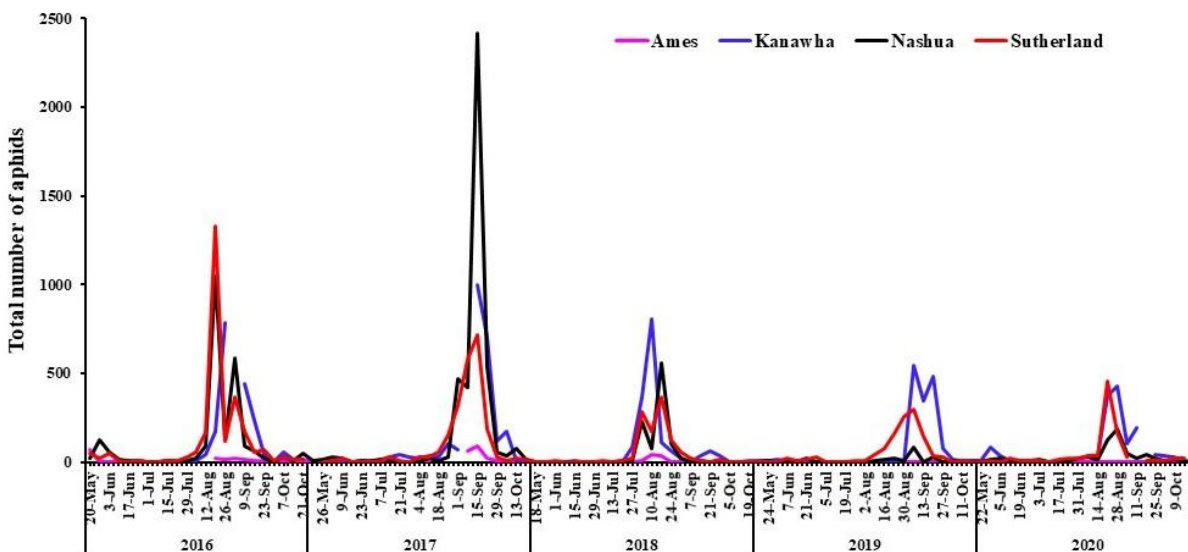


Figure 1. Seasonal population dynamics of aphids collected from suction traps located in Iowa weekly from May to October, 2016 through 2020.

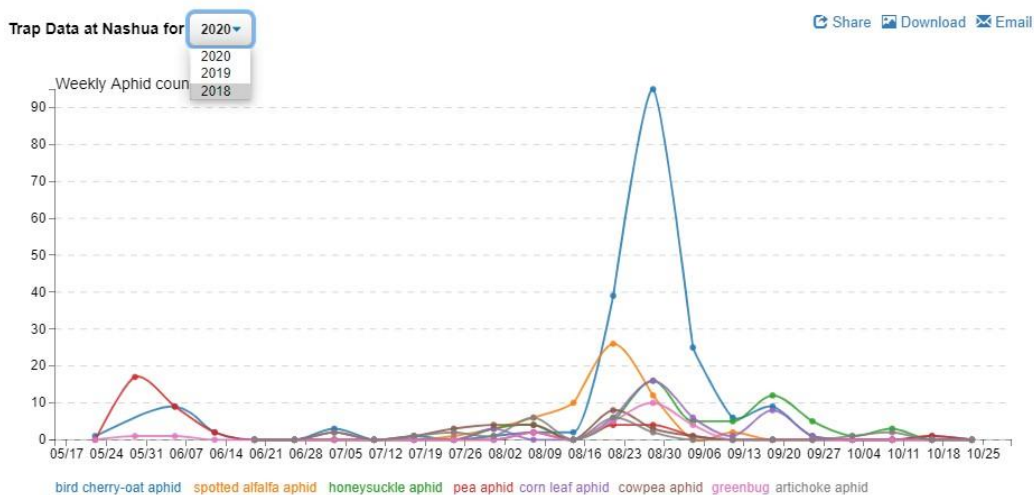


Figure 2. Screenshot of the seasonal population dynamics of aphids from suction traps located in Nashua, Iowa, collected in 2020 and published in <https://suctiontrapnetwork.org>. Y axis represents the weekly aphid counts, and the X axis the weekly dates of collections.

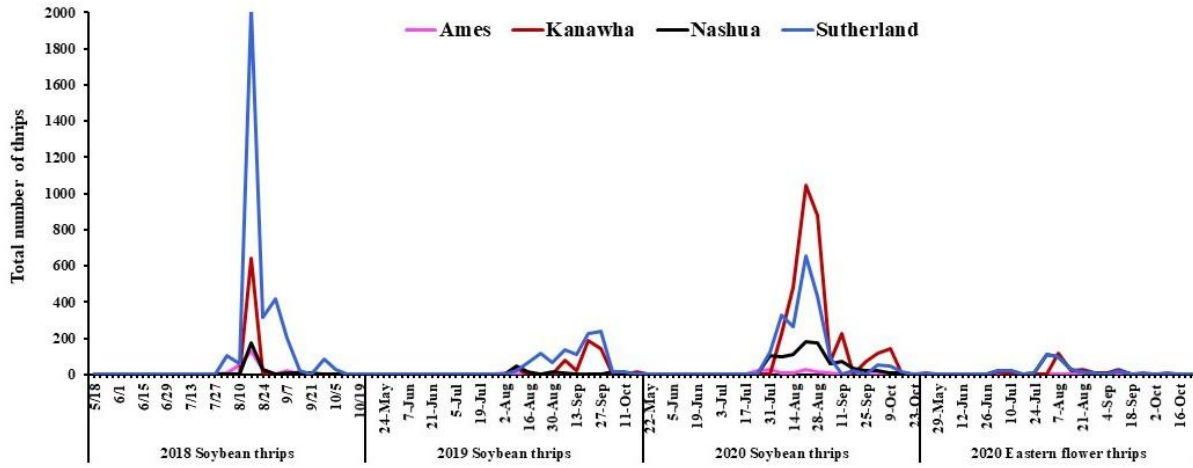


Figure 3. Seasonal population dynamics of soybean and Eastern flower thrips collected from suction traps located in Iowa, 2018 through 2020.