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Abstract

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Keywords

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Insects and Mites

Soybean aphids on the go: Results from the suction trap network

by Matt O'Neal, Department of Entomology

Since the soybean aphids' arrival in North America during 2000, there has been much speculation about how this new pest will establish and thrive. On-the-ground estimates have been helpful in measuring the range of this invasive species—currently, it is found in more than 22 states and three Canadian provinces.

Another source of information about the soybean aphids' habits in North America comes from a network of suction traps. David Voegtlin, an aphid taxonomist at the Illinois Natural History Survey, established the network in 2001 soon after soybean aphids were first reported in North America. The suction traps run from May through October and collect migratory aphids as they are flying. Voegtlin and his assistants sort through what the traps capture at the end of every week, counting and identifying all the aphids to species. During the early stages of the soybean aphids' invasion of North America, Voegtlin was reporting a remarkable trend (Figure 1). In years like 2003, where large populations were reported (several thousand per plant) during July and August, very few if any aphids were caught in September and October. This is interesting because soybean aphids making migratory flights during the fall are likely flying to buckthorn, their overwintering host. Curiously, during years like 2004 when very few aphids were observed on soybean plants during the growing season and few aphids were collected in suction traps, significantly more were caught during the fall. This trend has been observed several times in the suction trap network in Illinois (Figure 2).

Based on the suction trap data, Voegtlin successfully predicted the soybean aphid outbreaks of 2003 and 2005. He suggests that when suction traps collect a significant number of soybean aphids during September and October, there are likely to be large soybean aphid populations during the following summer. Although unconfirmed, he also suggests that these fall flights indicate overwintering success, and this success translates into large numbers of aphids leaving buckthorn in the spring for soybean fields. Conversely, when low



One of four suction traps set up in Iowa in 2005 for soybean aphid sampling. The traps are approximately 25 feet tall to collect winged aphids that are migrating from buckthorn to soybean and back. At this size, the traps are unlikely to collect aphids that fly from one soybean plant to another. Traps will be run from May through October during the 2006 growing season.

numbers of aphids are caught in the fall, there are likely to be few aphids staging the first invasion of soybeans during the subsequent spring.

As a consequence of Voegtlin's successful prognostication, more entomologists have helped expand his suction trap network. With funding from the Iowa Soybean Association, four traps were established in Iowa, and data from them are interesting. Where we saw our highest aphid populations in the field (northeast

Iowa), we had our highest suction trap captures, and where they were lowest in the field was where suction trap captures were consistently low. And although Voegtlin has suggested that some states may have a low risk for soybean outbreaks next year, the picture is not clear for Iowa. For example, suction traps in Michigan—the state that suffered aphid outbreaks on approximately 90 percent of its soybean acreage and had populations that reached 30,000 per plant—collected no soybean aphids during the months of September and October (Figure 3). In Iowa, we had some of the lowest trap captures throughout the growing season, but unlike other states, we observed migratory (fall flight) of soybean aphids in September (Figure 3; average per suction trap in September = 25 + 17).

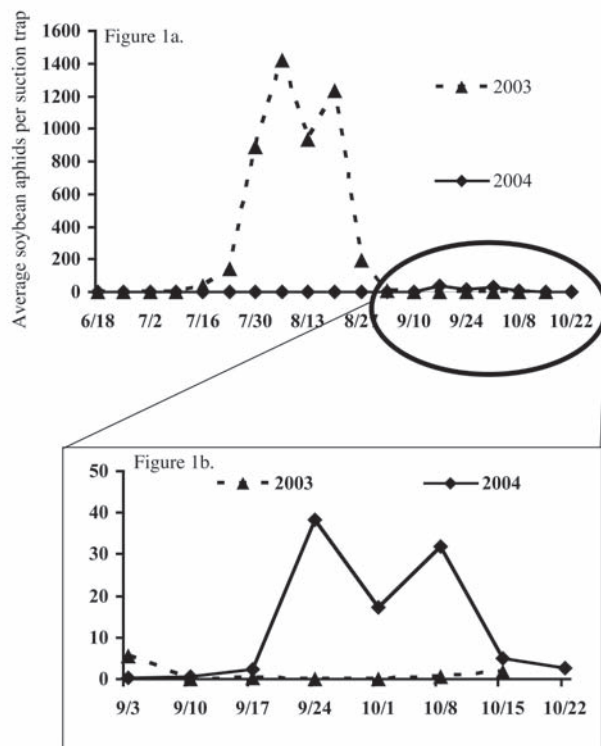


Figure 1. Summary of soybean aphids captured from 2003–2004 in nine suction traps in Illinois sampled (a) during the entire summer and (b) with a focus on the fall flight associated with soybean aphid migration to buckthorn, its overwintering host.

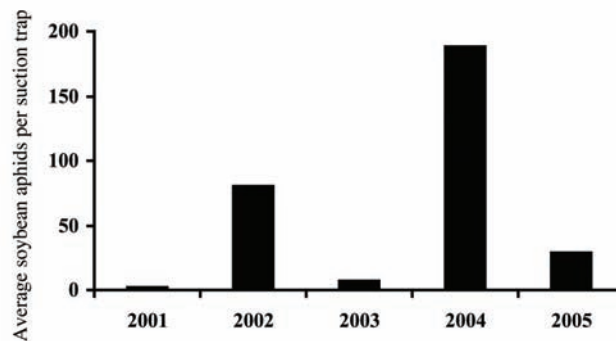


Figure 2. Five-year trend in fall flight of soybean aphids from nine suction traps in Illinois sampled during the fall flight associated with soybean aphid migration to buckthorn, its overwintering host.

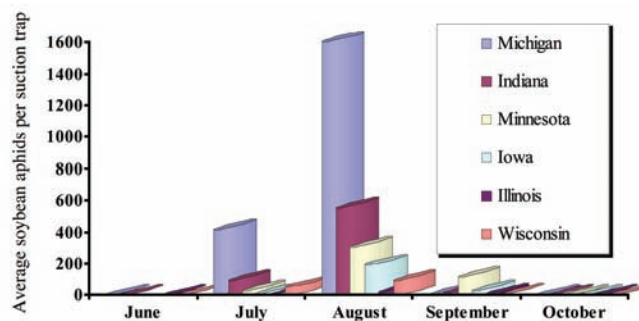


Figure 3. Regional summary of suction trap data from 2005 across six states. Traps were deployed for the first time in all states but Illinois. In Iowa, soybean aphids were trapped from mid-July to the end of October. The number of traps varied by state. Visit www.ncipmc.org/traps for more information.

So what does it all mean? The fall flight captures suggest that 2006 may be a low-risk year for soybean aphids. However, our first year of suction trap data in Iowa indicates that soybean aphids may have successfully overwintered. Without historical data like that from Illinois, it is hard to know what our first year of suction trap data in Iowa indicates. If you are looking for answers and are interested in how this story will continue into the future, visit www.ncipmc.org/traps for more information. This site has the 2005 data for all states with a link to each individual site, and for 2006, weekly updates will begin in May.

Matt O'Neal is an assistant professor of entomology with research and extension responsibilities for pest management in soybeans.