It arrived unheralded at the turn of the century—soft, yellow, and hungry. *Aphis glycines* Matsumura—the soybean aphid—is no more than 1/16 of an inch in length, but by 2001, the progeny of those first exotic interlopers were sucking enough soybean sap to reduce crop yields by 45% or more in some fields.

Today, this East Asian import has made itself at home in at least 21 states stretching across the U.S. Soybean Belt, a veritable buffet for an insect that produces up to 18 generations per summer, without ever mating.

Phillip Robertson, a professor of crop and soil sciences at Michigan State University's Kellogg Biological Station (KBS), says KBS entomologists were among the first to detect the uninvited pest. “When the soybean aphid arrived in 2000,” he says, “we were able to document that because we were watching; not for aphids necessarily, but watching.”

Robertson has been involved in long-term agricultural ecosystem, or agroecosystem, research for 20-odd years and is a former chair of the National Science Foundation's Long Term Ecological Research (LTER) Network, which KBS joined in 1987 as the sole agricultural site. “Very often, pest outbreaks are episodic and occur in unpredictable patterns without much warning,” he says. “If you’re not watching for them, or ready to observe them in a place that has a long-term observation capacity, then you’re not likely to find them when they first arrive and become a problem.”

That early period is critical, says Robertson, for understanding how the insects become established and how they can be controlled without resorting to costly and potentially hazardous pesticides. “We’re always going to be chasing these pests with chemicals, unless we understand their ecology.”

Indeed, soybean growers are applying millions of dollars of foliar sprays to control the aphids, at a cost of about $10 to $15 per acre. Not every farmer knows what KBS entomologists (including Doug Landis and Stuart Gage) discovered early on:...