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Soybean Aphid Egg Hatch Predicted in Northern Iowa

Abstract
Iowa's most significant soybean insect pest, soybean aphid, has host-alternating biology. This species has multiple, overlapping generations on soybean in the summer and moves to buckthorn in the winter. Fall migration to buckthorn is based on senescing soybean, and decreasing temperatures and photoperiod. For the majority of the year, soybean aphids are cold-hardy eggs near buckthorn buds (Photo 1). As spring temperatures warm up, soybean aphid eggs hatch and produce a few generations on buckthorn before moving to soybean (Photo 2). Tilmon et al. (2011) goes into more detail about the life cycle and biology of soybean aphid.

Disciplines
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Extension and Outreach

Integrated Crop Management

Soybean Aphid Egg Hatch Predicted in Northern Iowa

May 8, 2018

Iowa's most significant soybean insect pest, soybean aphid, has host-alternating biology. This species has multiple, overlapping generations on soybean in the summer and moves to buckthorn in the winter. Fall migration to buckthorn is based on senescing soybean, and decreasing temperatures and photoperiod. For the majority of the year, soybean aphids are cold-hardy eggs near buckthorn buds (Photo 1). As spring temperatures warm up, soybean aphid eggs hatch and produce a few generations on buckthorn before moving to soybean (Photo 2). Tilmon et al. (2011) goes into more detail about the life cycle and biology of soybean aphid.

Photo 1. Sexual females deposit eggs near buckthorn buds in the fall. Photo by David Voegtlin.

Photo 2. There are a few wingless generations produced on buckthorn before the spring migration to soybean every year. Photo by Chris DiFonzo (*Bugwood.org*).

For many aphids that overwinter as an egg, hatching often happens when the host resumes spring growth. This makes biological sense because the aphids feed on phloem from actively-growing tissue. If egg hatch happens too soon, they can suffer mortality from starvation. Research has confirmed soybean aphid egg hatch happens around buckthorn bud swell. Bahlai et al. (2007) developed a model to predict soybean aphid egg hatch based on accumulating degree days. They adjusted the model to include ambient air temperatures and solar radiation. Soybean aphid egg hatch occurs between 147-154 degree days (base 50°F) and buckthorn bud swell happens shortly after that (165-171 degree days). Based on air temperatures in 2018, we expect egg hatch is occurring in northern Iowa, where most of the buckthorn in Iowa is located (Figure 1).

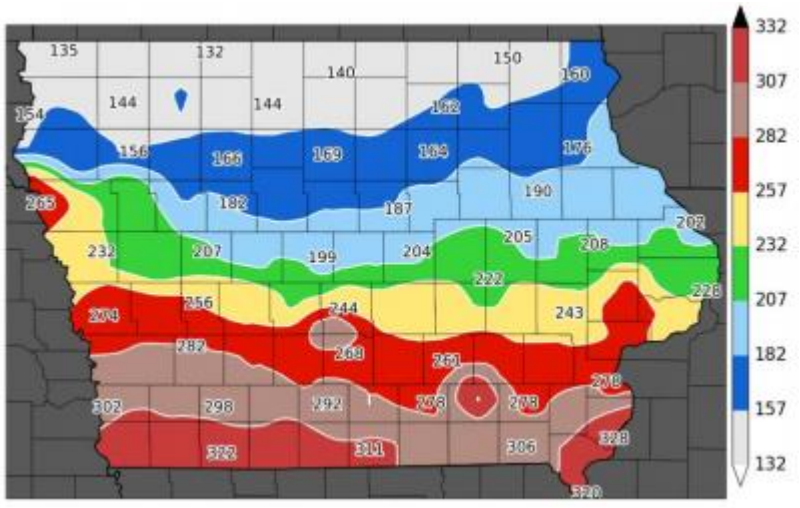

Figure 1. Accumulated growing degree

days (base 50°F) in Iowa from January 1 – May 7, 2018. *Map courtesy of Iowa Environmental Mesonet, ISU Department of Agronomy.*

References

Bahlai, C. A., J. A. Welsman, A. W. Schaafsma, and M. K. Sears. 2007. Development of soybean aphid on its primary overwintering host. Environmental Entomology 36: 998-1006.

Tilmon, K. J., E. W. Hodgson, M. E. O'Neal, and D. W. Ragsdale. 2011. Biology of the soybean aphid in the United States. Journal of Integrated Pest Management 2: A1-A7.

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Crop:

Soybean

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Dr. Erin Hodgson started working in the Department of Entomology at Iowa State University in 2009. She is an associate professor with extension and research responsibilities in corn and soybeans. She has a general background in integrated pest management (IPM) for field crops. Dr. Hodgson's curre...