1-10-2021

Summary of 2020 Insecticide Evaluations for Soybean Pests

Erin W. Hodgson
Iowa State University, ewh@iastate.edu

Ashley Dean
Iowa State University, adean@iastate.edu

Summary of 2020 Insecticide Evaluations for Soybean Pests

Abstract

Each year, the ISU Soybean Research Laboratory conducts insecticide efficacy evaluations for soybean aphid, and two emerging pests, Japanese beetle and soybean gall midge, were added in 2019. Details about pest biology, research plot design, sampling methods, and additional results can be found here.

Disciplines

Agricultural Science | Agriculture

IOWA STATE UNIVERSITY
Extension and Outreach

Integrated Crop Management

Summary of 2020 Insecticide Evaluations for Soybean Pests

January 10, 2021

Each year, the ISU Soybean Research Laboratory conducts insecticide efficacy evaluations for soybean aphid, and two emerging pests, Japanese beetle and soybean gall midge, were added in 2019. Details about pest biology, research plot design, sampling methods, and additional results can be found here.

Soybean aphid

We established one research plot for soybean aphid (Photo 1) at the Iowa State University (ISU) Northwest Research Farm in Sutherland, Iowa. Soybean aphid arrived to Iowa soybean in July. Populations grew slowly and did not peak in the untreated control until August 24 when the plants were at R6 (92 aphids/plant). When aphid populations peak after full seed set, we typically do not see any benefit of insecticide treatments on yield. The economic threshold was not reached at this location and an insecticide treatment would not have been justified.

Yield was not dramatically different among treatments. Statistically, Leverage 360 (foliar treatment [FT]), Pyrifluquinazon (FT), and CruiserMaxx Vibrance + Saltro (seed treatment [ST]) had the highest yields while Transform (FT) had the lowest yield.

Cumulative aphid days (CAD), which is a measure of a plant's seasonal exposure to aphids, ranged from 734 – 2,770. For reference, the economic injury level occurs at approximately 5,500 CAD. Warrior II (FT) had the most CAD and significantly more aphids than other treatments, followed by Cruiser 5FS (ST), Transform (FT), and Endigo ZCX (FT). Prior to insecticide application, the majority (86%) of aphids collected from these plots carried the genetic marker that indicates resistance to pyrethroids.

Photo 1. Soybean aphid colony. Photo by Erin Hodgson.

Japanese beetle

Japanese beetle (Photo 2) evaluations occurred at the ISU Northeast Research Farm in Nashua, IA and the ISU Johnson Research Farm in Ames, IA. Japanese beetle abundance is difficult to estimate because this pest is highly mobile. Peak beetle populations reached 7.3 beetles/10 sweeps at both research farms, lower than in 2019. Higher beetle numbers were observed in the untreated control and Transform (FT) plots at both locations; these results are consistent with data from 2019. Transform targets phloem-feeding insects and was unlikely to be effective on Japanese beetle.

Treatment thresholds for Japanese beetle are based on field-wide defoliation estimates. Defoliation was below 4% at the Northeast Research Farm and below 6% at the Johnson Research Farm. The typical economic threshold for defoliating pests in soybean is 30% during vegetative growth stages and 20% during reproductive growth stages. Defoliation at both locations was well below these thresholds and did not translate to measurable yield loss. We rarely see defoliation reach threshold levels in Iowa, especially for Japanese beetle alone. In both 2019 and 2020, we concluded that insecticides are able to reduce the number of beetles in the field for a few days, but there is no impact on yield and these applications are not likely to be economical with minimal defoliation.

Photo 2. Japanese beetle. Photo by Robert Koch.

Soybean gall midge

Insecticide evaluations for soybean gall midge (Photo 3) occurred at the ISU Northwest Research Farm in Sutherland and a commercial soybean field near Griswold, IA. Emergence of soybean gall midge adults began mid-June, and plants with larvae inside could be found shortly after. Emergence was continuous throughout the summer with three overlapping generations.

Compared to 2019, soybean gall midge pressure was low at both locations in 2020. No treatment at either location reached an injury rating of 1 (on a scale of 0-3), meaning less than 25% of plants showed injury symptoms in each plot. No yield differences were observed among treatments at the Northwest Research Farm. There was a lot of overlap at the Griswold Farm, but Asana XL (FT) had statistically higher yield than Belay (FT). At the Griswold Farm in 2019, when midge pressure was high and severely affected yield, neither of these insecticides were top performers and seed treatments seemed to provide more protection. Additionally, the timing of foliar insecticide application (at V2 vs. 10 days after first adult detection) did not impact injury ratings or yield. We are unable to confidently recommend any insecticides for soybean gall midge at this time.

Photo 3. Soybean gall midge infestation. Photo by Mitchell Helton.

Category: Insects and Mites

Links to this article are strongly encouraged, and this article may be republished without further permission if published as written and if credit is given to the author, Integrated Crop Management News, and Iowa State University Extension and Outreach. If this article is to be used in any other manner, permission from the author is required. This article was originally published on January 10, 2021. The information contained within may not be the most current and accurate depending on when it is accessed.

Crop:

Soybean

Tags: insecticide evaluation soybean pests

Authors:

Erin Hodgson *Professor*

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...

Ashley Dean *Education Extension Specialist I*

Ashley is an education extension specialist for field crop entomology at Iowa State University. She coordinates the Iowa Moth Trapping Network, develops educational resources for field crop pests in Iowa, and aids in the research efforts of the