

## **ML 2014, Chapter 312, Article 12, Section 8 Project Abstract**

For the Period Ending June 30, 2020

**PROJECT TITLE:** MITPPC Sub-project #2 Early detection, forecasting and management for *Halyomorpha halys*

**PROJECT MANAGER:** Dr. Bill Hutchison

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**FUNDING SOURCE:** Environment and Natural Resources Trust Fund

**LEGAL CITATION:** ML 2014, Chapter 312, Article 12, Section 8

**APPROPRIATION AMOUNT:** \$616,081

**AMOUNT SPENT:** \$616,081

**AMOUNT REMAINING:** \$0

Project Team: William Hutchison, Bob Koch, Peter Snyder, Tracy Twine

Post-doctoral training: Byju Govindan (Entomology), Stephan Liess (Soil, Water, and Climate)

Researcher: Eric Burkness (Entomology)

### **Sound bite of Project Outcomes and Results**

This project produced a new app to identify the brown marmorated stinkbug, improved traps for monitoring, and forecasted the range and development of stinkbugs in under future weather scenarios so farmers can anticipate infestations and use less insecticide. Brown marmorated stinkbug is a pest of soybean, corn, and fruit.

### **Overall Project Outcome and Results**

Just before the detection of the Brown Marmorated Stink Bug (BMSB) in Minnesota (2010), this invasive pest had caused approximately \$35 million in damage to the apple industry in eastern states. At the time, we knew very little of its biology, how to monitor this pest, how fast it could spread, and to what extent it could damage MN fruit, vegetable and field crops; a total of at least 12 major MN crops are at risk. With this project we were able to achieve several goals. To support early, more efficient detection of BMSB, we helped evaluate a new “Dual-lure” bait and sticky trap that was a huge improvement over previous traps. Likewise, to better forecast BMSB infestations we developed and tested a “heat-unit” or degree-day model. DD models are based on the fact that insects cannot regulate their body temperature (cold-blooded). Forecasts from the model were shared with growers via the *VegEdge* web page. This information is critical for understanding BMSB risk as a concern for many late-season high-value crops (sweet corn, tomatoes, raspberries, apples, wine grapes). Moreover, we found that the MN-acclimated BMSB has a faster developmental rate (egg to adult) and females produce nearly 30-40% more eggs/female than previously suspected. Finally, the BMSB development data have been combined with future weather models, summarized by Dr. Peter Snyder’s team (Soil, Water & Climate, UMN), to assess potential BMSB change over time.

### **Project Results Use and Dissemination**

A diversity of outreach and dissemination methods were used to deliver research results from this project to a variety of audiences, including farmers of field crops and fruits and vegetables, crop consultants, the general public, and to researchers at professional conferences.

A [front page article](#) was published in the Star Tribune about our work, as well as another [Star Tribune article](#) the year before. We created a [BMSB web resource and fact sheet](#), which was published in three additional languages: Hmong, Somali, and Spanish. More website resources were created including [Degree-day Model forecasts for Midwest Insects: BMSB](#) (updated daily during growing season) and [BMSB in MN Apple Orchards and Varietal Impacts](#). Pieces on our work were published in the University of Minnesota Extension [Fruit and](#)

[Vegetable News](#), University of Minnesota Extension Minnesota Crop News in [2016](#) and [2018](#), [Fruit Growers News](#), [Vegetable Growers News](#), and a map was created by the [Minnesota Department of Agriculture](#) using data from the MITPPC project.

Many peer reviewed publications resulted from this work including in [Insects](#) and the [Journal of Economic Entomology](#). Multiple conference presentations were given at places such as Upper Midwest Invasive Species – North American Invasive Species Management Association Joint Conference, Meeting of Entomological Society of America, and the Fifth Biennial Upper Midwest Invasive Species Conference.