

**Environment and Natural Resources Trust Fund  
2018 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 138-D**

Monitoring and Biocontrol of Brown Marmorated Stink Bug

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**Category:** D. Aquatic and Terrestrial Invasive Species

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**Total Project Budget:** \$ 199,224

**Proposed Project Time Period for the Funding Requested:** 3 years, July 2018 to June 2021

**Summary:**

Brown marmorated stink bug is increasing in Minnesota. This project will expand monitoring to identify areas of spread, and gather data on native parasitoids and predators and implement biological control.

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**Sponsoring Organization:** Minnesota Department of Agriculture

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**Location**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

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**Alternate Text for Visual:**

Graph and map brown marmorated stink bug trap catches across Minnesota. Pictures of surveying for native parasitoids, colony establishment cages and Trissolcus japonicus emerging from BMSB eggs.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____ %



**PROJECT TITLE: Monitoring and Biocontrol of Brown Marmorated Stink Bug**

**I. PROJECT STATEMENT:**

Our project will expand the previously established monitoring network of brown marmorated stink bug (BMSB) (*Halyomorpha halys*) across Minnesota to identify new areas of spread and establishment, survey and develop baseline data on native predators and parasitoids of BMSB as well begin to implement biological control.

**Monitoring:**

Since the first Minnesota find in 2010, the brown marmorated stink bug (BMSB) has become established in Minnesota and has been reported and confirmed in 18 counties. Reproducing populations are growing at a fast rate in the Twin Cities area and insects have now begun to spread rapidly across the state. During 2016 there was a significant increase (over 90%) of both BMSB trap captures and confirmed reports. This means the insect is overwintering and reproducing successfully. The previous project funded through ENRTF has successfully tracked this increase across the landscape and growers are more prepared as a result and homeowners are more aware. However, this is a critical time to maintain and build upon monitoring efforts as BMSB continues to increase in urban, orchard and field crop settings and economic and home nuisance impacts could soon be realized.

**Biological Control:**

As BMSB populations build in Minnesota, there is a potential for increased pesticide use in homes, yards, agricultural fields and orchards. There is also a potential for yield loss in fruit and vegetable crops. In areas of the U.S. where BMSB has been present longer, BMSB damage and nuisance impacts resulted in large increases of insecticide use. However, through research at the USDA, we are now close to having access to biological control agents for BMSB (parasitic wasps, *Trissolcus* spp). Biological control is a promising management option for BMSB and if successful would help to reduce insecticide use against this insect. Preliminary surveys also suggest there is a suite of native predators and parasitoids occurring in Minnesota, however their role is still poorly understood. We propose to survey for native predators and parasitoids and initiate a biocontrol program for BMSB in Minnesota through this project.

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1: Expansion of BMSB Monitoring Across Minnesota**

**Budget: \$99,323**

Minnesota Department of Agriculture will work with homeowners, other state agencies such as state campgrounds and DOT waysides and growers such as apple orchards and soybeans growers across the state to continue and build upon past monitoring efforts. Monitoring sites will be selected that help track the movement of BMSB into new areas as well as gauge the population size of BMSB in known infested areas. The MDA will work closely with the U of M in this activity to optimize the geographic placement of traps, as well as standardizing the trapping systems used and activity reporting. Monitoring will also be used to guide more targeted and appropriate biological control.

Outcome	Completion Date
1. Coordinate monitoring network for BMSB and maintain an online status map.	April - October each year
2. Monitoring data will be used by UMN to validate forecasting models	December each year

**Activity 2: BMSB Biocontrol Implementation**

**Budget: \$99,901**



**Environment and Natural Resources Trust Fund (ENRTF)**

**2018 Main Proposal**

**Project Title: Monitoring and Biocontrol of Brown Marmorated Stink Bug**

The U of M, in collaboration with USDA, has been conducting research on cold hardiness of parasitic wasps of the brown marmorated stink bug funded by ENRTF. While these wasps have not yet been approved for release by the USDA, we expect that approval to occur during the timeframe of this project. In the meantime, there is a need to assess the existing assemblage of parasitic wasps already present in Minnesota. Moreover, one species of parasitic wasp, *T. japonicus*, has been discovered in other parts of the country and it is possible it is already present in Minnesota. In cooperation with the U of M, we will place stink bug egg masses at monitoring sites, allow the eggs to be parasitized by naturally occurring parasitic wasps, and then rear out the parasitic wasps in the laboratory for identification. When *T. japonicus* or other species of parasitic wasps become approved and available for release, we will begin introducing them in areas with established BMSB populations. Depending on which is most efficient we will either obtain parasitoids as needed from an external source, or we will establish a rearing program in Minnesota to supply these needs.

<b>Outcome</b>	<b>Completion Date</b>
<i>1. Maintain and expand stink bug colonies and cold storage methods for production stink bug eggs (U of M)</i>	<i>Continuous</i>
<i>2. Survey for and rear naturally occurring parasitic wasps and assess presence of T. japonicus (MDA &amp; U of M)</i>	<i>June through August each year</i>
<i>3. Prepare specimens and identify species present (U of M)</i>	<i>September through May each year</i>
<i>4. Obtain BMSB parasitoids and introduce to infested monitoring sites, if approval for release is granted (MDA)</i>	<i>June through August each year</i>

**A. Project Team/Partners**

**Receiving funds:** MDA will lead Activity 1. MDA will work in tandem with Dr. Robert Koch at the U of M for Activity 2 to assess naturally occurring parasitic wasps in Minnesota and, if approval for release is granted, implement a BMSB biocontrol program.

**Not receiving funds:** For monitoring, we will draw on and expand volunteers from the various groups that were established in the previously funded LCCMR project. Dr. Bill Hutchinson will use trapping data to validate forecasting models being developed via a BMSB project funded by the Minnesota Invasive Terrestrial Plants and Pests Center.

**B. Project Impact and Long-Term Strategy**

This project will expand our already existing monitoring network for BMSB that will likely prove useful for both growers and homeowners for years to come. Data from this project will also be essential to help establish seasonal phenology of BMSB in Minnesota and will be useful for developing new IPM programs. This project will be the first implementation of biological control for BMSB in Minnesota, which is a critical need for proactively dealing with this pest in an economically and environmentally sustainable manner.

**C. Timeline Requirements**

This project is a proposed three-year project 2018-2021 and builds on efforts from previous LCCMR projects on BMSB Monitoring and Biological Control Evaluation 2014-2017

## 2018 Detailed Project Budget

**Project Title: Monitoring and Biocontrol of Brown Marmorated Stink Bug**

### IV. TOTAL ENRTF REQUEST BUDGET 3 years

<u>BUDGET ITEM</u>	<u>AMOUNT</u>
<b>MDA Personnel</b>	
Activity 1 and 2: Survey and Biological Control Coordinator (0.5 FTE) = Salary (56,898 = 17.40 X 3270 hrs) + Fringe (25% of salary =14,225) * 3 years	\$ 71,123
<b>MDA Equipment/Tools/Supplies</b>	
Activity 1: Lures, traps and supplies for monitoring network including lures, bags, vials and other supplies. \$3,500 * 3 years	\$ 10,500
<b>MDA Travel</b>	
Activity 1 and 2: Vehicle rental and fuel . We will use the least expensive methods of travel which will be either a state vehicle or a rental vehicle. Approx. \$5,300/yr *3 years	\$ 15,900.00
Activity 1 and 2: Meals and lodging for MDA Coordinator (approx. 20 days of travel/yr for survey coordinator) at approximately 600 per year * 3 years	\$ 1,800
<b>MDA Contractual</b>	\$ 99,901.00
Activity 2. U of M Personnel: A 0.5 FTE technician is required to lead the work at the U of MN and coordinate with MDA (yr1: \$23,375 salary, \$6,759 fringe; yr2: \$24,076 salary, \$6,597 fringe; yr3:\$24,799 salary, \$6,795 fringe)	\$ 92,401
Activity 2:U of M Equipment/Tools/Supplies Total:Supplies such as mesh and pvc pipe for cage construction, seeds and produce for feeding insects, and other miscellaneous supplies for insect rearing and insect preservation will be required (yr1: \$1,000; yr2: \$1,000; yr3: \$1,000).	\$ 3,000
U of M Additional Budget Items Total: Rental of growth chamber and greenhouse space is also required for maintaining colonies of insects (yr1: \$1,500; yr2: \$1,500; yr3: \$1,500).	\$ 4,500
<b>MDA Total</b>	
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$ 199,224</b>

### V. OTHER FUNDS

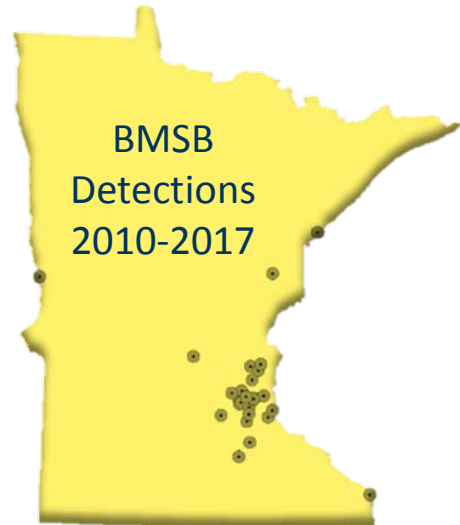
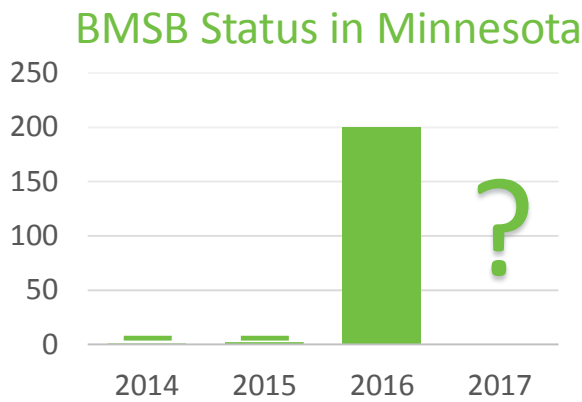
<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
<b>Other Non-State \$ To Be Applied To Project During Project Period: N/A</b>	\$ -	<i>Indicate:</i>
<b>Other State \$ To Be Applied To Project During Project Period: N/A</b>	\$ -	<i>Indicate:</i>
<b>In-kind Services To Be Applied To Project During Project Period: MDA:</b> ab equipment, computing/software and data management and oversight of monitoring network (\$21,000 for MDA). Unrecovered federally negotiated F&A (calculated at 52% MTDC) constitutes the U of MN cost share (\$86,852).	\$ 107,852	<i>Secured</i>
<b>Funding History:</b> Brown Marmorated Stinkbug Monitoring and Biological Control Evaluation from ENRTF, M.L. 2014, Chp.226, Sec. 2, Subd. 04f-2	\$ 99,000	<i>Spent</i>
<b>Remaining \$ From Current ENRTF Appropriation:</b>	\$ -	



# SOMETHING STINKS...

**Brown Marmorated Stink Bug**  
*(Halyomorpha halys)*

## OBJECTIVE 1: MONITOR SPREAD



## OBJECTIVE 2: ASSESS & IMPLEMENT BIOLOGICAL CONTROL



Survey natives, build colonies and release parasitoids



## **Project title Something Stinks! Monitoring BMSB Spread & Biological Control Implementation**

### **Qualifications**

**Project Manager: Angie Ambourn M.S., Entomologist Pest Detection and Management Unit, Plant Protection Division, Minnesota Department of Agriculture**

Angie Ambourn has been an entomologist for years and has worked with the Department of Agriculture since 2014. She has worked all over the country from Alaska to South Dakota and Minnesota on a variety of invasive insects.

Some of her job responsibilities related to this project include:

- Project design, development and coordination
- Monitoring the distribution, spread and abundance of new and emerging plant pests in Minnesota
- Facilitating management efforts such as biological control for new and emerging plant pests such

Angie has collaborated with the University of Minnesota on other projects including past work on BMSB, Mountain Pine Beetle, EAB Biocontrol and Spotted Wing Drosophila.

### **Organization Description**

The Minnesota Department of Agriculture's Plant Protection Division has primary responsibility for detection efforts related to emerald ash borer and other new terrestrial invasive plant pests. Minnesota Department of Agriculture is responsible for plant protection (Minnesota Statute 18G.01) and is the lead agency on brown marmorated stink bug in Minnesota.