Award Category: International IPM Award of Recognition

Type of Nomination: Team/Group (Project)

Nominee Name of Individual or Group: StopBMSB

Improving economic benefits related to IPM adoption: Checked
Reducing potential human health risks: Checked
Minimizing adverse environmental effects: Checked

Brief Summary of Nominee's or Program's Accomplishments (500 words or less):
In 2009, the Northeastern IPM Center funded a small working group focused on an emerging insect pest, known as the brown marmorated stink bug (BMSB). Since then, this group has developed into a national program (StopBMSB) that directly involves more than 80 individuals and has received grants from the USDA-NIFA-SCRI totaling $11,097,704. In addition, related projects including a NIFA-OREI project, former regional 'RIPM' projects, and commodity group funding sources also contributed to the development of strategies for dealing with this invasive pest.

From the beginning, the goal of StopBMSB has been to incorporate IPM as the backbone for the management of this destructive and widespread pest. Research and Extension personnel, farmers, growers, state and federal agency representatives, and many others have banded together to focus their efforts to understand the biology and ecology of BMSB in a systems approach for managing in orchard crops, small fruit, grapes, vegetables, and ornamentals across the US.

The specific accomplishments of StopBMSB include 1) extensive information on seasonal phenology and development of BMSB including presence of bivoltine populations in the mid-Atlantic and Pacific Northwest and using this information to generate a model to predict voltinism, population dynamics, and geographic range, 2) establishing baseline dispersal capacity of BMSB populations and techniques for tracking their movements through the environment, 3) identifying specialty crops at high, moderate and low risk of BMSB attack and developing an online publication entitled "Host Plants of BMSB in the United States", 4) documentation that BMSB becomes the dominant stink bug species in areas where it becomes well established and that some regions (e.g., eastern coastal plain) may not be suitable for this invasive species, 5) importance of vertical transmission of maternal gut symbionts – critical for survivorship and fecundity, 6) publication of the first full transcriptome of and the salivary proteins from BMSB, thereby providing molecular resources for novel targets for control, 7)identification of the BMSB aggregation pheromone and synergist allowing for season-long detection and monitoring of BMSB populations, 8) identification of landscape level risk factors from BMSB based on blacklight trapping, 9) identification of effective insecticides against BMSB and support for Section 18 emergency exemptions for bifenthrin and dinotefuran for tree fruit growers, 10) identification of effective native natural enemies in various specialty cropping and wild host habitats as well as progress on the potential for a classical biological control introduction of Trissolcus japonicas, 11) robust Extension/outreach activities including over 22,000 stakeholder contacts through traditional meetings and extensive online presence via the project website and video series (see www.stopbmsb.org), and 12) specialized training for the next generation of IPM specialist including over 20 post-docs, 20 graduate students and 100 undergraduates.

Describe the goals of the program being nominated; why was the program conducted? What condition does this activity address? (250 words or less):
The goals of StopBMSB are to develop economically and environmentally sustainable pest management practices for the brown marmorated stink bug (Halyomorpha halys (Stal)) in a wide variety of cropping systems, including specialty crops, and to implement a coordinated, rapid delivery system to disseminate critical information generated from the program to end-users and stakeholders.

The StopBMSB Working Group that started in 2009 documented that no established detection method, treatment threshold or control strategy for BMSB existed in most cropping system. During the 2010 growing season, numerous regional and national conference calls, webinars, meetings, and briefings discussed the grim prospects faced by producers battling BMSB and the need for a rapid, coordinated and collaborative research effort. The national press also extensively covered BMSB because of the severe damage to crops and nuisance problems for homeowners and businesses. This media spotlight served to highlight the immediate need for research and outreach efforts to mitigate the severe agricultural problems posed by BMSB. The specific environmental, economic, and sociological concerns generated by BMSB has led to a conclusion among the agriculture producer community that BMSB poses an unprecedented threat to U.S. agriculture and food security.

Describe the level of integration across pests, systems and/or disciplines that was involved. (250 words or less):

StopBMSB began in 2009 with a small working group that involved 30 individuals in the Northeast. The group materialized based on the emergence of BMSB as a pest of unprecedented importance to orchard crops, small fruit, grapes, vegetables, and ornamentals. The group identified key components associated with the potential for BMSB to have a large impact, including a very broad host range, unusual movement and dispersal behaviors, making detection and management challenging, and no established detection methods, treatment thresholds or control strategies.

Over the next 4 years and with funds from the USDA-SCRI program, StopBMSB grew into a national multidisciplinary team of 51 scientists from 13 institutions in 10 states that brought expertise from a wide range of research and Extension subject areas including entomology, IPM, applied field ecology, host-plant resistance, taxonomy, biological control, insect behavior, chemical ecology, molecular genetics, horticulture, plant pathology, agricultural economics, and sociology.

StopBMSB has been assembled in a rather short period of time to tackle this agricultural crisis. The approach of StopBMSB is designed to rapidly expand knowledge of basic biology, ecology, and behavior of BMSB in cropping systems and to develop short-, medium- and long-term sustainable solutions.

Describe the team building process; how did the program being nominated get partners involved? Education and awareness are essential in an IPM program. (250 words or less):

The initial StopBMSB Working Group meeting was held at the Appalachian Fruit Research Station in Kearneysville, WV on June 15-16, 2010. Since that time, seven additional meetings have been held. Meeting attendance averages between 75-100 individuals with attendees from >15 states and several countries including Switzerland, Canada and Mexico and additional webinar attendees from numerous states and countries such as South Africa. The main reason why the BMSB program was able to get partners involved was because of the wide spread occurrence of the pest and the network of individuals that spans regions, institutions, and agencies. Currently, BMSB has been officially detected in 41 states and the District of Columbia. Agricultural problems have been detected in at least 12 states including MD, WV, VA, NJ, PA, DE, NY, NC, OH, OR, TN and WA. Despite the level of coordination and vigorous dissemination of research results and outreach efforts from the StopBMSB Working Group and other affiliated groups, there is still a great need for expertise and training as BMSB spreads across the country as well as sustained efforts to reduce duplication of effort and leverage resources. The research and Extension community involved in StopBMSB are cognizant of the need for a coordinated approach. In light of this, StopBMSB coordinates with other Regional IPM Centers and the NIMSS BMSB Multi-State Project to reduce duplication of effort, has held intensive diagnostic clinics devoted to identification of all BMSB life stages, crop injury diagnostics and key natural enemies, facilitates discussions with key commercial companies to improve quality and availability of monitoring tools, and updates their priorities based on outputs generated from a number of extramural projects and pest status in new regions.

What outcome describes the greatest success of the program?:

The development of a small group of individuals into a national team in a relatively short period of time to address an emerging pest with significant potential for damage is the greatest success of StopBMSB. The awareness about BMSB and science-based information generated by StopBMSB has led to multiple benefits for growers that will result in effective, long-term management. Without question, StopBMSB is a model for cross collaboration between agencies, institutions, and growers that began with a group of interested and engaged individuals who saw the need before BMSB became the problem that it is now.

Provide evidence of change in knowledge, behavior or condition as a result of the program/individual. (250 words or less):

Prior to the initiation of the StopBMSB Working Group, most growers were unfamiliar with BMSB and its damage. StopBMSB has or is currently working in the following areas to assess impact: 1) measuring changes in attitudes, skills, knowledge, and practices that result from research with, and outreach to, the agricultural crop community, 2) assessing the impact of BMSB on specific commodities, and 3) determining the cost and effectiveness of control strategies. Initial results have shown substantial economic damage caused by BMSB, which has provided background for economic analyses of management methods. The information is contributing to helping the project team prioritize efforts for specific crop commodities and encourage grower adoption of new control tactics.

Crop growers are becoming more familiar with the biology of and threat posed by BMSB. Through StopBMSB, growers have been taught the critical aspects of the biology and ecology of BMSB, how to recognize injury, how to monitor, and which management options to consider. The use of online and paper surveys has been the backbone of collecting this information and then developing and disbursing critical information. The continuing spread of BMSB into new regions and the threat posed to a diversity of crops necessitates a national network for sustained and coordinated delivery of BMSB information. The collaboration between the Northeastern IPM Center (e.g., StopBMSB website) and land grant Extension personnel has provided the framework for this network.

Who or what should receive the most credit for the success of this program?

StopBMSB could not have gotten to where it is today without the dynamic and persevering leadership of Dr. Tracy Leskey, Entomologist with the USDA-ARS at the Appalachian Fruit Research Station in Kearneysville, WV.

If selected, suggested Citation for Award Certificate (40 words or less):

StopBMSB: Sustaining Coordinated Efforts and Multiplying Expertise