

Brown Marmorated Stink Bug: Research and Control

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The brown marmorated stink bug (BMSB), *Halyomorpha halys* (Stål) is an invasive insect native to China, Taiwan, Korea, and Japan accidentally introduced into the United States sometime in the mid- to late 1990s. Over the past several years, BMSB has emerged as a pest of increasing concern to agriculture in the United States. Currently, large populations are now established in PA, NJ, DE, MD, WV, and VA; all of these states have documented severe losses in a number of crops and tremendous nuisance problems for homeowners and businesses. Furthermore, established populations have been detected in CA, CT, IN, KY, NH, NY, OH, OR, and TN, though crop losses have been minimal at this early stage of infestation. Additional states where BMSB has been detected include AL, AZ, FL, GA, IA, IL, MA, ME, MI, MN, MS, NC, NE, RI, SC, TX, VT, WA, and WI. In 2011, BMSB was confirmed in Ontario, Canada.



Fig. 1 Adult BMSB on nectarine

In 2010, BMSB populations increased dramatically and attacked many crops in the mid-Atlantic region. Damage in commercial orchard crops reached critical levels with some growers losing entire blocks of stone and pome fruit (Fig. 1, 2, and 3). Severe post-harvest losses from cold storage also were reported for apple throughout the region. In addition, extensive damage and crop losses were reported for peppers, tomatoes, corn, soybeans, and caneberries. Extensive



Fig. 2 Early-season BMSB injury on peach

damage to woody and herbaceous ornamentals and to grapes also was reported. In 2011, overwintering survivorship of adults from human-made structures and from wild or natural overwintering sites was substantial. Large populations immigrated into stone fruit orchards in late May-early June to feed on immature fruit. Growers who treated with broad spectrum insecticides at frequent intervals during this primary period of risk had substantially less injury than those that did not. Subsequently, growers have radically altered their management practices to control BMSB, an insect that is now consider the

single most important concern in many cropping systems. Tree fruit growers are typically

making 2-4x more insecticide applications than in previous years and generally with older, broad-spectrum materials, for example. Those who have maintained a vigilant and very aggressive spray schedule have been able to minimize damage whereas those who did not saw increases in injury. Similarly, chemical treatments have been added to other crops to minimize BMSB injury. A prime example is soybean; growers have made applications in the peripheral areas of soybean fields to combat BMSB. Though growers have been able to reduce injury, these radical departures from previous management regimes have resulted in increased costs (insecticides, fuel, equipment maintenance, and labor) and inputs making this approach unsustainable both economically and environmentally. An obvious casualty of BMSB in agriculture is the devastation to integrated pest management (IPM) programs put into place over the past several decades as well as the tremendous challenges this insect poses for the organic community.



Fig. 3 Late-season BMSB injury on apple

In order to develop effective long-term solutions for managing this invasive species, we must (1) define the basic biology, phenology, and behavior of BMSB in agroecosystems, urban landscapes, and in native, unmanaged habitats; (2) establish the host range and preference of BMSB for both cultivated and wild hosts as well as susceptibility of cultivated hosts; (3) assess and survey BMSB populations to establish geographic distribution, population density and potential spread; (4) develop effective stimulus-based monitoring tools for BMSB to allow growers to make informed management decisions; (5) develop effective behaviorally-based attract-and-kill management strategy for BMSB to reduce insecticide inputs; and ultimately (6) Establish biological control efforts (whether parasitoid, predator, or pathogen) to reduce or eliminate this insect as a pest of agricultural and urban settings.

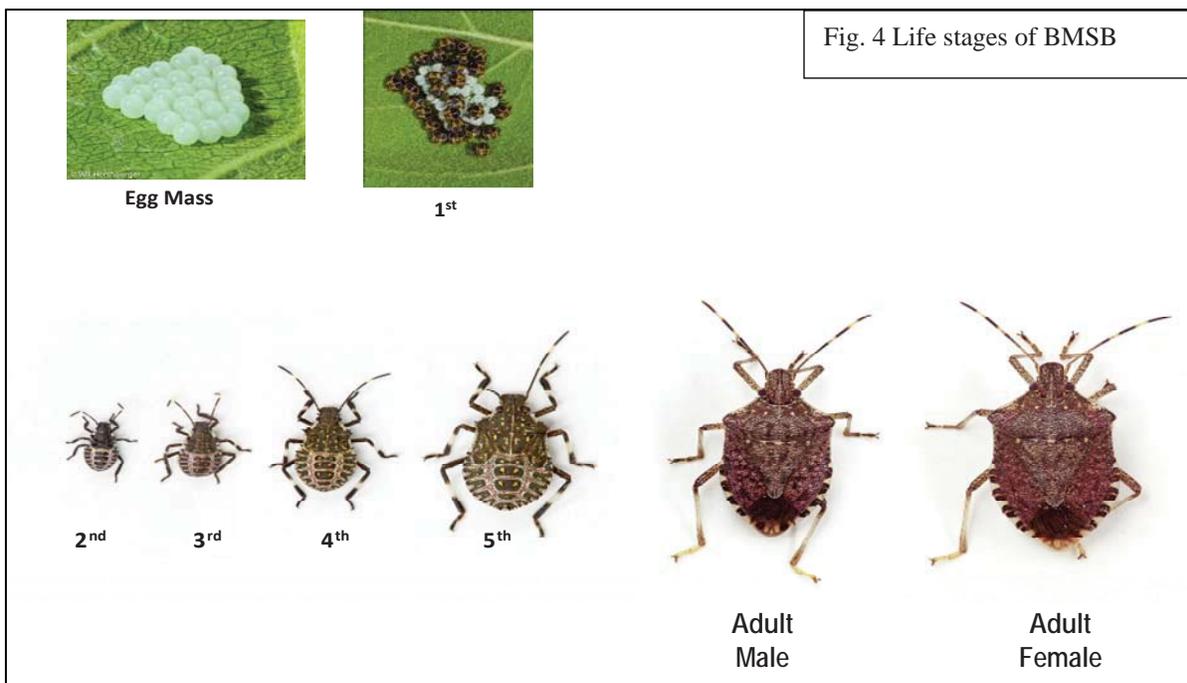


Fig. 4 Life stages of BMSB