A Summary of Brown Marmorated Stink Bug Damage in New Jersey Fruit Crops – 2010

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The brown marmorated stink bug (BMSB), *Halyomorpha halys*, mushroomed into a serious insect pest throughout much of eastern Pennsylvania, New Jersey, western Maryland and the Cumberland-Shenandoah area during 2010. The insect was introduced from Asia, and first found near Allentown, PA in the mid 1990's. It has an extremely wide host range, which includes tree fruits, small fruits, vegetables, ornamentals, and seeded crops such as corn and soybeans. The insect feeds by puncturing the fruit with piercing/sucking mouthparts, and injecting saliva which allows the insect to suck up the plant material through its mouthparts. Fruit tissue at the point of entry and just below into the flesh, then dies and the rest of the fruit grows around it. This leaves a sunken area on the skin at the point of entry, and browning, dead tissue in the flesh. Early injury on stone fruit can go all the way to the pit. The tissue dies, and as the fruit grows, can form cavities in the flesh. Photos of adults and nymphs feeding on peaches, apples and pears can be seen in Figure 1. Internal feeding damage is illustrated in Figure 2.

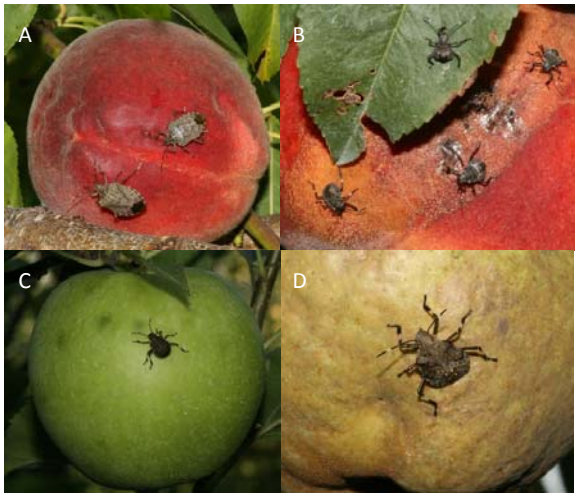

Figure 1. Stink bugs on fruit – **A.** adults on peach, **B.** nymphs on peach, **C.** nymph on apple, **D.** nymph on pear. Note

The insect had 2 generations in 2010. Overwintered adults disperse from overwintering sites in houses and other structures, or protected areas near farms. They enter the orchard, mate and lay eggs. Nymphs hatch from the eggs and undergo 5 nymphal instars before maturing into adults. First instar nymphs feed on what's left from the chorion or egg shells. They then move out through the canopy in search of fruit for food as they mature through 4 additional instars. Adults mature, mate, and the cycle repeats. Unlike other fruit pests, after it arrives in the orchard, BMSB spends its entire life feeding on the fruit, and

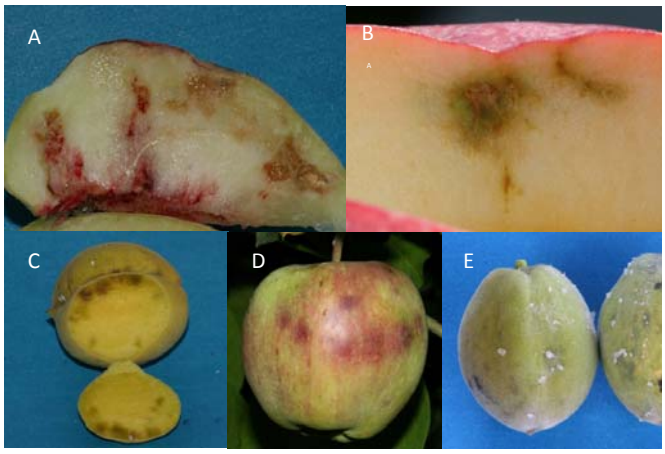

Figure 2. Internal and external damage from brown marmorated stink bug – **A.** internal necrosis in peach, **B.** internal necrosis in apple, note depth of feeding where mouthparts extended into apple , **C.** water-soaked areas in peach, **D.** external damage on apple, **E.** recent bleeding spots on peach.

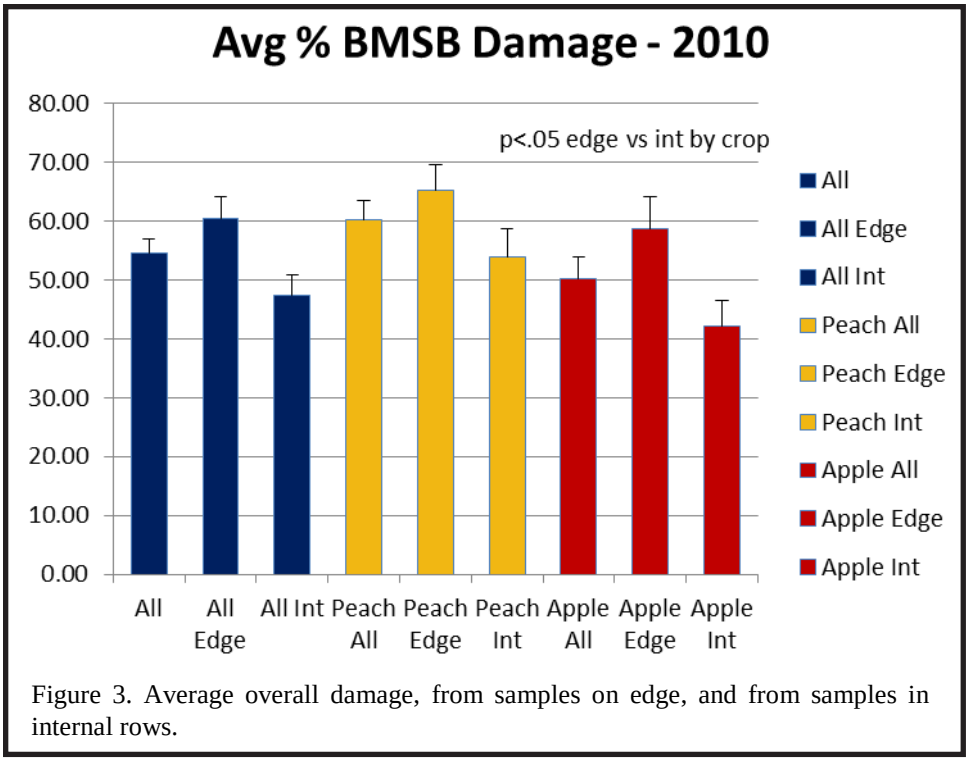

Figure 3. Average overall damage, from samples on edge, and from samples in internal rows.

found just over 54% damage across all sampled fruit. Damage was significantly higher towards edge rows. Interiors of peach blocks averaged almost 54% damage, while edge rows averaged 65% damage. The pattern was similar in apples where an average of 42% damage was seen on interior rows compared to 59% damage on edge rows (Figure 3). One peach planting was seen with 97% damage. Other blocks were only slightly damaged, but damage was present throughout NJ at some level. In some cases, damage seemed to increase over time (Figure 4).

every life stage, other than the egg, causes damage. As the stink bugs become established in managed fields, they are heavily biased towards edge and border rows. In tree fruit this has resulted in higher populations near wooded borders and soybean fields.

Initial damage surveys were completed in 2010. Workers in several Mid-Atlantic States initiated a survey program using the same methodology in each state. We sampled 10 fruit from each of 10 trees on an outside row, and 10 fruit from 10 trees on several inside rows that were at least 5-6 trees in from the edge of the block. We assessed both samples for the number of fruit injured with 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, or >10 injuries per fruit. We took a total of 68 samples across 18 farms for a total of 6,800 sampled fruit.

Mean damage levels were significant. We

This insect cannot be controlled with many common tree fruit insecticides, including Imidan and Sevin. While we do not yet know what insecticides will be the most satisfactory, various pyrethroids gave some control in 2010. Unfortunately these materials have short residual properties, can disrupt orchard

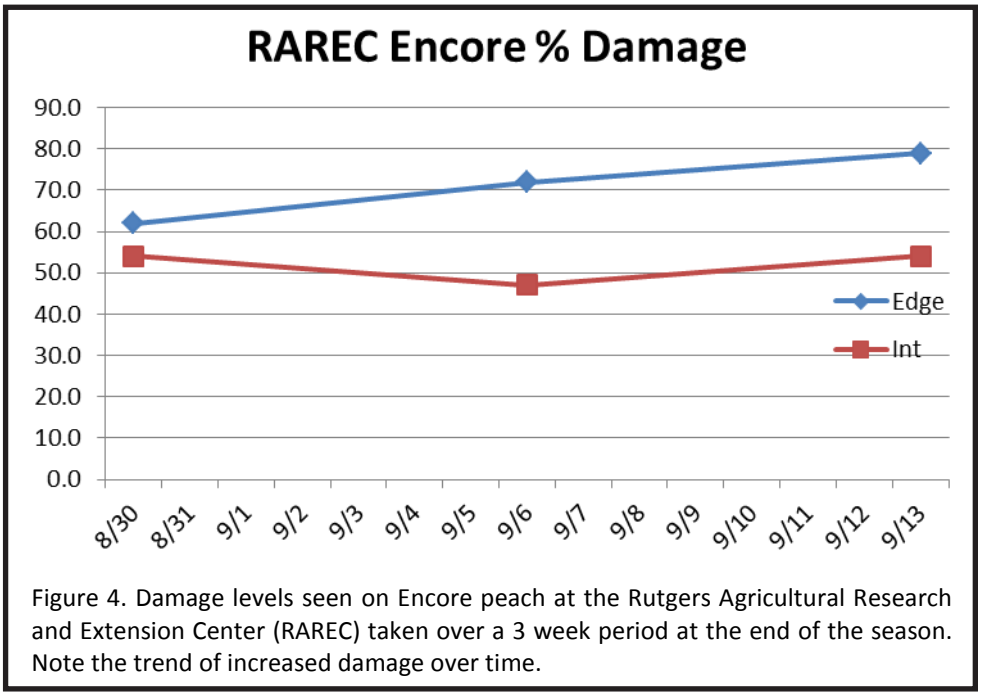

Figure 4. Damage levels seen on Encore peach at the Rutgers Agricultural Research and Extension Center (RAREC) taken over a 3 week period at the end of the season. Note the trend of increased damage over time.

ecosystems, and insects can become resistant to them with repeated applications. Carbamates (methomyl), and several neonicotinoids have shown some activity in ongoing research tests. It is important to note that during 2010, the high damage levels seen were present even though most growers were using intensive insecticide programs. Since little is known about this insect, research programs need to be developed throughout the states that have become infested with BMSB. Over the next several years, researchers will attempt to address questions concerning its life history, environmental and temperature effects, monitoring and control tactics, and other management practices that can be used to control this insect.

Table 1. Brown marmorated stink bug sample summary – 2010.

Date	Crop	Variety	Date	Crop	Variety
8/10	Peach	Harrow beauty	8/27	Asian Pear	Mix
8/12	Peach	Jerseyqueen	9/14	Peach	Encore
8/12	Peach	Blushing Star	9/2	Apple	Gala
8/13	Peach	Sweetenup	9/13	Apple	Cameo
8/13	Peach	Glowing star	9/15	Apple	Red Del
8/16	Peach	Mix	9/15	Apple	Gold Del
8/23	Peach	Mix	9/15	Apple	Mutsu
8/30	Peach	Cresthaven	9/15	Apple	Red Del
8/17	Peach	Encore	9/16	Apple	Empire
8/16	Peach	Jerseyqueen	9/16	Apple	Red Del
8/16	Peach	Cresthaven	9/20	Apple	Red Del
8/23	Peach	Cresthaven	9/13	Apple	Fuji
8/24	Peach	Encore	9/17	Apple	Macoun
8/27	Peach	PF 17	9/21	Apple	Red Del
8/30	Peach	Parade	9/29	Apple	Mix
8/31	Peach	Encore	10/6	Apple	Granny Smith
9/7	Peach	Encore	10/6	Apple	Rome
8/27	Apple	Mix	10/14	Apple	Fuji

N=68 samples, 32 peach, 34 apple, 2 Asian pear, 18 farm sites.