The recent appearance of the brown marmorated stink bug (BMSB) as a significant pest in fruit and vegetable fields in Cotton Belt states has kept researchers busy identifying management strategies. This pest, which first began making headlines as a nuisance for homeowners, has since contributed to millions of dollars in crop losses for tree fruit producers in the upper Southeast, among other places. Although it hasn't made a significant economic impact in cotton, cotton specialists are keeping a wary eye on this potentially disastrous pest.

The BMSB (Halyomorpha halys) is an invasive insect native to China, Taiwan, Korea and Japan. It was introduced into the U.S. in the mid- to late 1990s, and was first properly identified in Allentown, PA, in 2001. Entomologists in Virginia say the insect was first discovered in the northern part of their state in 2005, and it has made its presence known ever since.

BMSB targets a wide range of host crops. While it has caused the most damage in apples and peaches, it has also been found in grapes, berries, pears, tomatoes, peppers, sweet corn, soybeans, and very rarely, in cotton.

This opportunism on the part of the BMSB has some cotton specialists speculating that the pest could eventually find a home in cotton fields. Because it is able to feed on tougher fruiting crops, researchers have reason to believe it will have no problem with mature cotton bolls.

The pest’s geographic range expands yearly – another fact that has some Cotton Belt researchers on alert. As of 2011, it had been officially detected in 33 states as well as the District of Columbia.

Since arriving in Virginia in 2005, the BMSB has spread to all regions of the state, although it does not have a strong infestation rate in the coastal plains region of the state where cotton is grown. The pest’s habit of overwintering in man-made structures creates problems for insect control efforts, and is a departure from the habits of native stink bug species.

“The BMSB overwinters in large aggregations (thousands in
a single group) in buildings, homes, sheds, et cetera, which is not the case for native species," says Dr. Ames Herbert, an entomologist at Virginia Tech University. "These protected areas allow for excellent overwintering success and in the spring, they migrate en masse into wooded areas to feed and reproduce and then go into the agricultural landscape."

That final stage of migration has caused serious damage to the tree-fruiting industry in the Mid-Atlantic region. While that damage left a toll, fruit producers have taken that experience and laid out a game plan in combatting the pest that may be applied to other crops, including cotton, should the need arise.

According to researchers at the USDA-Agricultural Research Service Appalachian Fruit Research Station in Kearneysville, WV, growers who maintained a vigilant spray schedule in 2011 minimized damage, whereas those who did not observed increases in injury. Though growers have been able to reduce injury, this has come at a substantial price due to costs associated with increased insecticide applications and labor.

There are a number of issues that make BMSB a particularly difficult pest to control, according to Extension and USDA researchers.

- Multiple generations: up to six generations per year have been reported in Asia
- Unlike native stink bug species, both adults and nymphs have been found to feed on fruit
- A longer feeding beak than native species causes more damage when feeding, and allows the pest to penetrate tougher surfaces, likely including late-season bolls.

Dr. Herbert believes the insect’s proboscis (feeding beak) could possibly cause added problems for growers. If it ever develops a taste for cotton, the BMSB could cause problems later in the season, causing growers to make costly insecticide applications later in the year.

“In 2011, we conducted a series of field cage studies that showed, in brief, that BMSB appeared to have a preference..."
for larger cotton bolls, even bolls mature enough to be ‘safe’ from green and brown stink bugs,” says Herbert. “This is not good. We are repeating these studies this season and if we find the same results, it would mean that if they move into the cotton growing region and into fields, the current stink bug thresholds would have to be changed to accommodate this preference for older bolls, and cotton would have to be protected with insecticides for a longer period.”

Herbert stressed that the BMSB has not caused any economic damage in cotton in his state to this date. He and fellow entomologists in the region are conducting preliminary studies in order to be more familiar with the pest if it ever does become a problem in cotton production.

**Monitoring**

Adults will emerge sometime in the spring (late April to mid-May) and mate and deposit eggs from May through August. The eggs hatch into small black and red nymphs that go through five molts. Adults begin to search for overwintering sites starting in September through the first half of October.

USDA researchers have been working on studying the movement patterns of BMSB in order to come up with the most effective trapping systems. In the meantime, the most critical element for successful BMSB management is one learned by those in the fruit and vegetable industry who have learned their lessons through first-hand experience. The key is the development of a reliable pest detection and monitoring strategy, according to Penn State entomologists Larry Hull and Greg Krawczyk. “In every orchard, due to the ability of adult BMSB to move quickly among various hosts, a constant and vigilant monitoring program is the very basis for successful management.”

Overcoming the challenges of effective and sustainable BMSB control will not be an easy task in the near term. Much research needs to be done in order to develop the most effective management program for the long-term control of this pest. However, if growers are not careful in how they manage BMSB, they may be causing many future pest problems by destroying the natural enemies that help keep many of the other pests of tree fruit in balance.
BMSB Attack Plan: Three Tips to Educate Your Growers, Protect Their Yield

Many fruit and vegetable growers know all too well the yield-robbing damage the brown marmorated stink bug (BMSB) can quickly cause in crops. But experts warn that BMSB could make a destructive impact into even more crops this season, including soybeans and possibly cotton.

John Cranmer, Valent field market development specialist, said that “in soybeans, stink bugs can quickly damage the pods, causing the plants to actually revert back so they never mature and remain green longer into the harvest season. This, of course, results in significant yield loss.”

Preparing for the Battle

To fight the voracious BMSB, Cranmer recommended dealers work with their growers on a three-pronged assault:

1) Scout early, scout often:

“BMSB is extremely aggressive and fast spreading. A field or orchard may appear clean one day, but then covered with BMSB two to three days later. As a result, many researchers suggest starting a treatment plan at the first signs of BMSB.”

2) Treat before thresholds:

“Growers must stay ahead of this pest. Once BMSB is beyond recommended thresholds, the sheer numbers make it extremely hard to manage, and you’ll need to tank mix with a pyrethroid. Soybeans are especially vulnerable to the BMSB from R4 through R6.”

BMSB thresholds vary by crops, and researchers are working on coming up with a threshold for soybeans. For now, the following thresholds should be used:

- 1 per row foot, regardless of row spacing
- 2.4 per 15 sweeps at 7” to 21” row spacings
- 3.6 per 15 sweeps at >21” row spacings

3) Stay vigilant:

Given the aggressive nature of BMSB, Cranmer said retailers should remind growers throughout the season about the dangers of BMSB, especially if it has been spotted in a neighboring geography.

Choosing Your Weapon

Experts often recommend Belay®, Danitol® and Venom® Insecticides to provide excellent stink bug protection across a variety of crops. In lab bioassays and real-world field situations, each of these insecticides is proven to quickly and effectively control stink bugs, including BMSB, and fit well into a season-long IPM approach.

Each of the Valent products brings unique benefits to growers:

- **Belay**: The active ingredient in Belay has reliable and fast activity against adult and nymph stink bugs and other key insects, including aphids. Belay is the only Valent insecticide labeled for BMSB in soybeans, and is also for use in many other crops.
- **Danitol**: Registered in more than 120 crops, Danitol also works quickly on stink bugs and, unlike many other pyrethroid materials, won’t flare mites.
- **Venom**: Venom brings the powerful active ingredient of one of the most-used products in Asia home to the invasive BMSB.

For more information on the Valent portfolio to fight BMSB and other tough insects, please visit www.valent.com/bmsb.

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**BMSB on Soybeans**

A. Herbert, VA Tech

Source: Foliar treatments applied on 8/17

Trial conducted in Orange County, Virginia

- **Belay** 4 fl oz/A
- **Endigo ZC®** 5 fl oz/A
- **Baythroid® XI** 2.8 fl oz/A
- **Orthene® 97 0.5 lb/A**
- **Untreated**