

# Status of *Halyomorpha halys* in the Mid-Atlantic U.S.

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# Mid-Atlantic Researchers Providing Input



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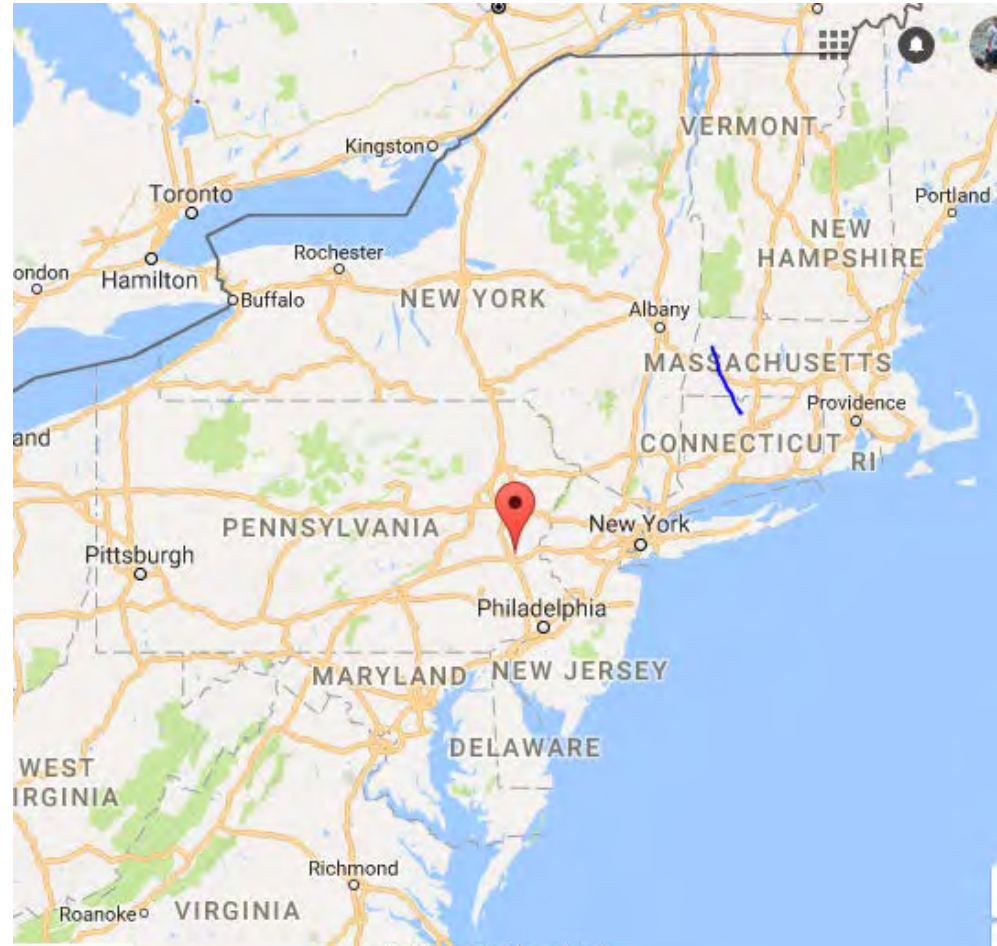
Tracy Leskey



Anne Nielsen and George Hamilton

# Brown marmorated stink bug

- 1st detected around Allentown, PA in the late 1990s (Hoebeke & Carter 2003)



Hoebeke, E. R. & M. E. Carter. 2003. *Halyomorpha halys* (Stål) (Heteroptera: Pentatomidae): A polyphagous plant pest from Asia newly detected in North America. Proc. Entomol. Soc. Wash. 105(1): 225-237.

## Early 2000s – urban nuisance



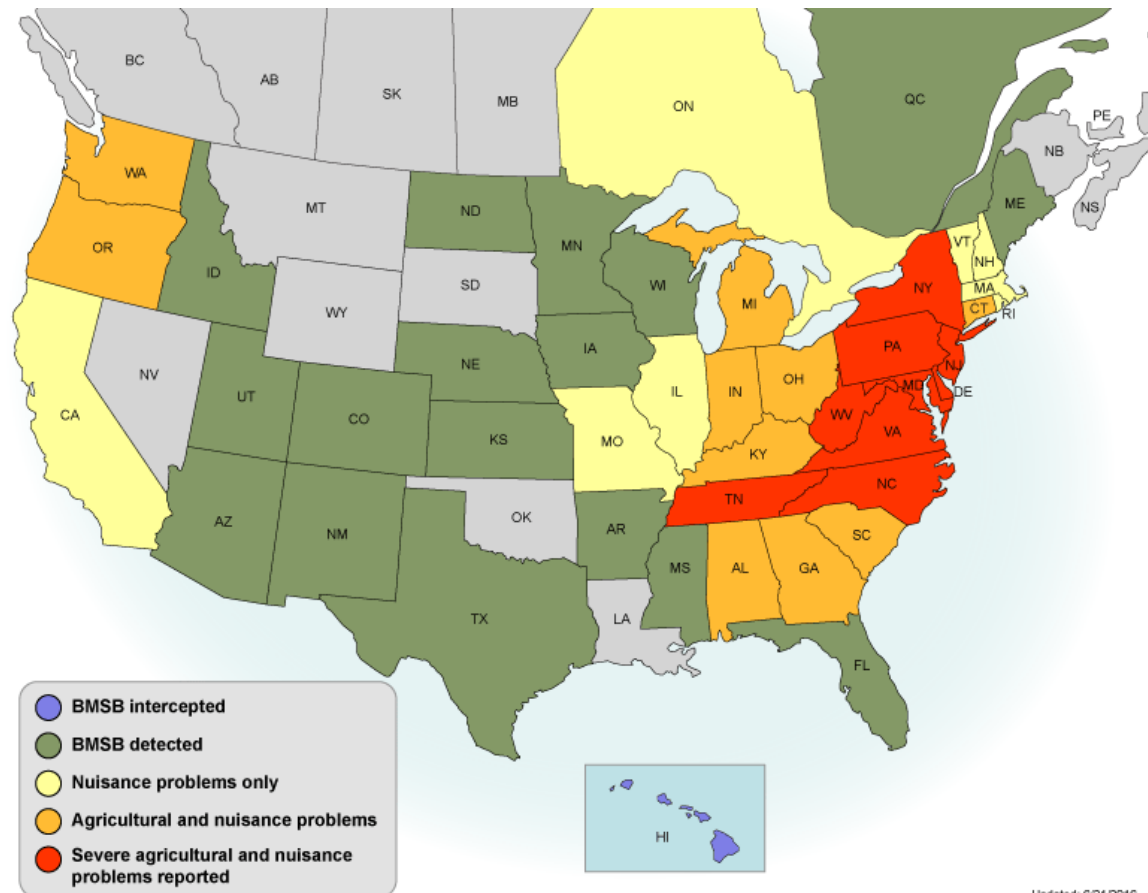
## Mid-2000s – tree fruit pest<sup>1</sup>



<sup>1</sup>Nielsen, A. L., and G. C. Hamilton. 2009. Seasonal occurrence and impact of *Halyomorpha halys* (Hemiptera: Pentatomidae) in tree fruit. J. Econ. Entomol. 102: 1133-1140.

# Brown marmorated stink bug

- From the mid- to late 2000s, BMSB became established in all states in the Mid-Atlantic Region





# Soybeans – late 2000s

BMSB has become a dominant stink bug in many soybean fields in the mid-Atlantic U.S.<sup>1</sup>



<sup>1</sup>Nielsen, A. L., G. C. Hamilton and P. W. Shearer. 2011. Seasonal phenology and monitoring of the non-native *Halyomorpha halys* in soybean. *Environ. Entomol.* 40(2):231–238.

# 2010 – tree fruit industry suffered serious economic losses

- Some growers losing entire crops of stone fruit.
- Among apple growers, losses were totaled in excess of \$37 million in the region [1].



<sup>1</sup>United States Apple Association, "Asian pest inflicting substantial losses, raising alarm in eastern apple orchards," Apple News, vol. 41, no. 8, p. 488, 2010.



2010 – the Mid-Atlantic U.S. also suffered serious problems in many other crops





# BMSB Damage in Soybean

- Flattened pods
- Shriveled, deformed, and stained seeds
- Reduced seed quality/yield
- “Stay-green syndrome”
  - Delayed harvest
  - Green plant material contamination
  - Mechanical malfunction of equipment



Owens, D., D. A. Herbert, G. Dively, D. Reisig, and T. Kuhar. 2013. Does feeding by *Halyomorpha halys* (Hemiptera: Pentatomidae) reduce soybean seed quality and yield? J. Econ. Entomol. 106: 1317-1323

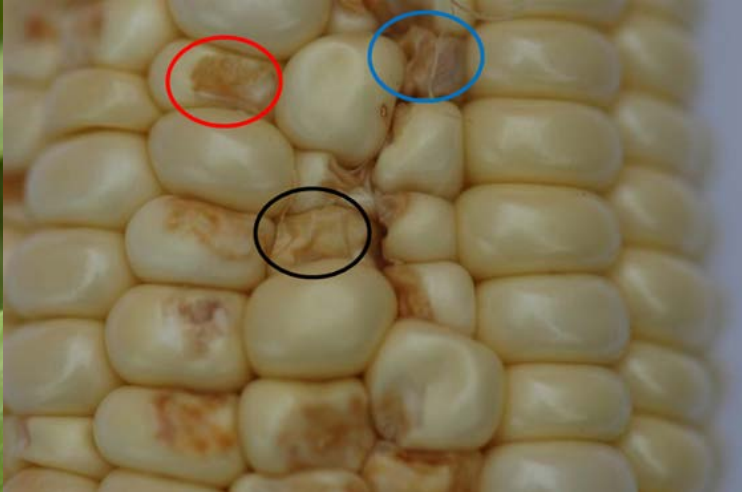
# Corn

- Incomplete pollination (missing kernels)
- Collapsed kernels
- Shrunken kernels





# Vegetables





# Impact of BMSB on Vegetable Crops

- Although probably not a suitable host plant for BMSB egg laying and early nymphal development (Zobel et al. 2016), tomato can suffer severe fruit damage, particularly in late August.



Zobel, E.S., G.P. Dively, and C.R. Hooks. 2015. Seasonal Abundance, Host Suitability, and Feeding Injury of the Brown Marmorated Stink Bug, *Halyomorpha halys* (Heteroptera: Pentatomidae), in Selected Vegetables. *J Econ Entomol.* 2016 Mar 30. pii: tow055



Things looked really, really bad  
coming off the 2010 season in the  
Mid-Atlantic



# Since then,

- We've not experienced BMSB densities that high and widespread as in 2010
- Some severe cold winters probably knocked back populations in some years
- BMSB pest status is not the same in all areas of the Mid-Atlantic Region

- BMSB outbreaks are strongly associated with certain geographic and climatic ranges
- The lower elevations and Coastal Plain Region where most vegetables and field crops are grown has very few BMSB



# BMSB can't take the heat

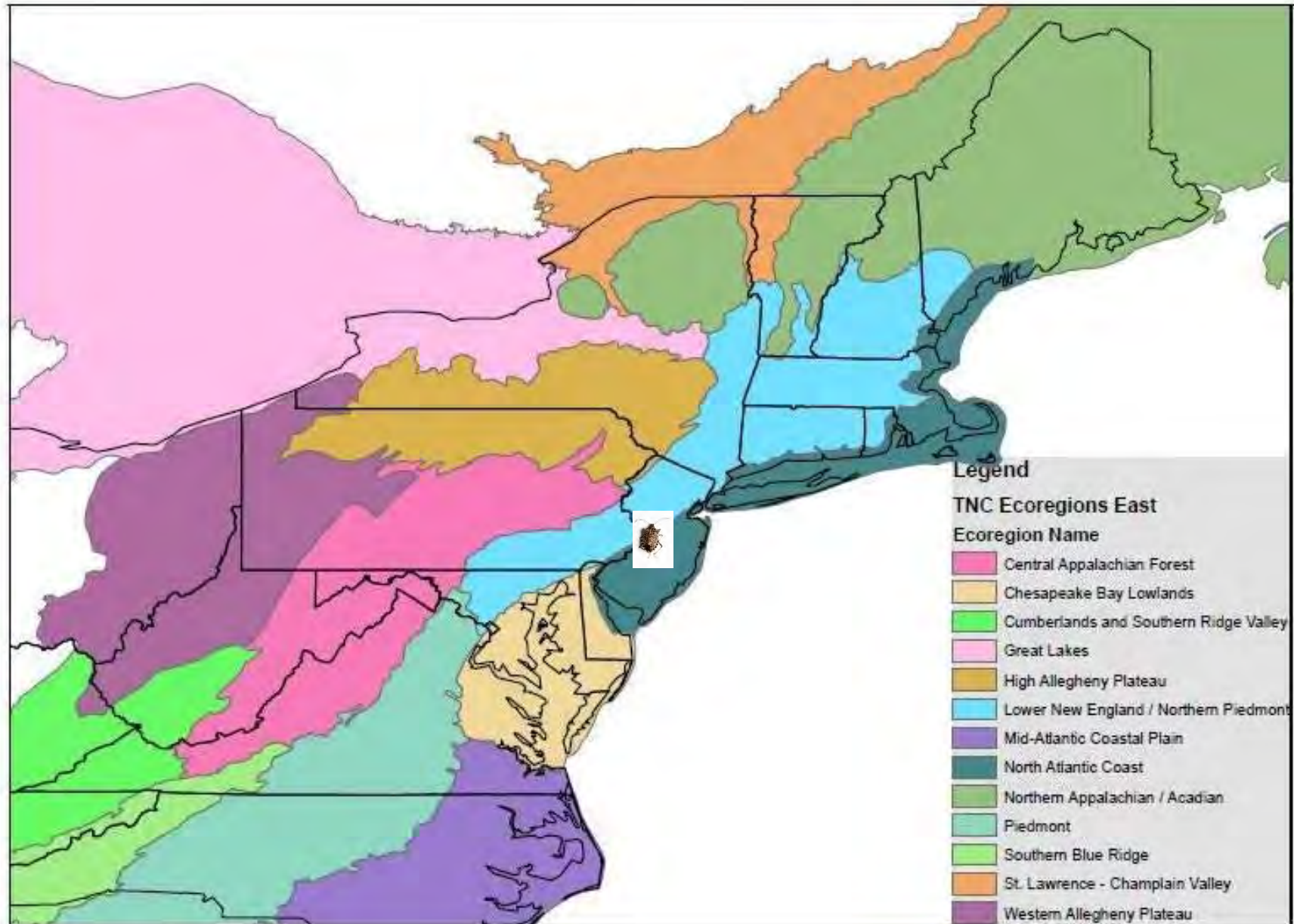
- In the lab, temps.  $>40^{\circ}\text{C}$  ( $104^{\circ}\text{F}$ ) resulted in mortality <sup>1</sup>
- Bug feeding & development is negatively impacted at temps  $>33^{\circ}\text{C}$  ( $91^{\circ}\text{F}$ )<sup>2</sup>

<sup>1</sup> Aigner, J.D. and T.P. Kuhar. 2016. Lethal high temperature extremes of the brown marmorated stink bug (Hemiptera: Pentatomidae) and efficacy of commercial heat treatments for control in export shipping cargo. *J. Agr. Urban Entomol.* 32: (1) 1—6.

<sup>2</sup> Nielsen, A. L., G. C. Hamilton, and D. Matadha. 2008a. Developmental rate estimation and life table analysis for *Halyomorpha halys* (Hemiptera: Pentatomidae). *Environ. Entomol.* 37: 348-355.



# EcoRegions of the Eastern U.S.



# BMSB is a tree-loving bug that needs multiple hosts



Tree of Heaven



Catalpa



Paulownia



Peach



Mulberry



Wild cherry



# **BMSB is a border driven pest**



# 2016 Season Recap in the MidAtlantic

- In PA, pest problems appear to be focused in tree fruit in the southern part of the state
- In WV and western MD, higher densities in tree fruit in 2016 than previous couple of years
- In NJ, relatively low pest pressure – mostly in tree fruit
- In MD, only a pest in western and central counties
- In DE, has not really been a serious pest for a few years
- In VA, pest problems in western and northern counties only