

Northern Michigan FruitNet 2014

Northwest Michigan Horticultural Research Center

Special Update
June 26, 2014

USDA did not provide an estimate this year. Tart cherry numbers are based on the processor and CIAB estimates in millions of pounds.

Tart Cherry Estimate - 2014

Michigan

NW MI	125
WC	44
SW	22
MI Total	191

Other States

NY	8.5
PA	1
WI	9.5
UT	35
WA	24
OR	2
Other States Total	80

US TOTAL **271**

Other Estimates

MI sweets 30,000 tons

MI apples ~27-28 Million bushels

NORTHWEST MICHIGAN REGIONAL UPDATE

Emily Pochubay and Nikki Rothwell, MSUE Educators

Rainfall has been spotty with variable rainfall accumulations in the northwest region this week. Earlier in the week forecasts were predicting rain on Tuesday, 24 June and Wednesday, 25 June. Some areas in the region did not receive the rain that was predicted, while other areas received drizzles or short periods of down pours. South of Leelanau county (Benzonia, Bear Lake, etc.) can't seem to catch a break in rain. Throughout the week, relative humidity has been high and there have been several foggy mornings in most areas.

Sweet cherries are ripening and becoming more visible in the tree canopy. Some cherry fruit that are already red and farther along will likely drop; many early ripening varieties are developing a pink hue on cherries throughout tree canopies and blocks. We are continuing to receive reports of declining apple trees that are suspected to be the result of winter injury at this time. However, in general, apples are sizing well, June drop fruit are finally falling, and the apple crop looks pretty good. In tart cherries, although the crop is variable among locations, fruit are sizing well.

Growers have been protecting from **cherry leaf spot**, **brown rot**, and **powdery mildew** in the last week. Considering the warm wet weather and that sweet cherry fruit are ripening, the development of diseases, particularly **American brown rot** is concerning. We have received more reports of American brown rot sporulating in sweet cherries. Growers need to consider brown rot in their disease programs in these warm and wet conditions that favor the development of this disease. We had cooler temperatures in the last few days and growers have used copper and Syllit for leaf spot protection in tarts. These materials will not provide control against powdery mildew or brown rot. We have also received reports of dropping leaves in tart cherry as a result of **cherry yellows virus**.

We received very light rain yesterday at the station and **apple scab** spores were discharged at our monitoring site; we found 4 spores per spore rod, down from the count earlier this week of 12.5 spores per rod. Primary scab is not over yet, but the end is near.

Several leaf spot and scab infection periods occurred in some areas this week. In particular, areas near Bear Lake and Benzonia have received multiple rains and have had consecutive days with leaf spot and scab infection periods.

Northwest Disease Report: Most recent wetting event (Report issued 6/26/2014 14:33)

Wetting periods start with rainfall (at least 0.01 inch) and continue until the start of at least eight hours without moisture (rainfall, leaf wetness, high relative humidity). Wetting periods are classified as "ongoing" until eight consecutive dry hours have passed. After that, the official end of the wetting period is recorded (the start of the 8 hour dry period).

Station	Start of wetting period	End of wetting period	Duration (Hrs.)	Avg temp (F)	Rainfall (In.)	Apple Scab (leaf)	Cherry Leaf Spot	Grape Leaf Black Rot	Time Period Assessed
Bear Lake	6/23 8-9AM	6/24 9-10AM	Wet: 19 Span: 26	63.2	0.04	Heavy (Symptoms appear: 7/2)	High	Yes	Most recent period shown: 6/19 Midnight-1AM to 6/26/2014 1-2PM
Benzonia	6/25 11AM-Noon	Ongoing. Last hour with moisture: 6/26 8-9AM	Wet: 21 Span: 22	60.9	0.11	Heavy (Symptoms appear: 7/5)	High	Yes	Most recent period shown: 6/19 Midnight-1AM to 6/26/2014 1-2PM
East Leland	6/23 10-11AM	6/23 Noon-1PM	Wet: 3 Span: 3	68	0.03	None	None	None	Most recent period shown: 6/19 Midnight-1AM to 6/26/2014 1-2PM
Eastport	6/23 11AM-Noon	6/23 1-2PM	Wet: 3 Span: 3	69.2	0.01	None	None	None	Most recent period shown: 6/19 Midnight-1AM to 6/26/2014 1-2PM
Elk Rapids	6/25 4-5PM	Ongoing. Last hour with moisture: 6/26 7-8AM	Wet: 13 Span: 16	59	0.02	Moderate (Symptoms appear: 7/4)	Low	Yes	Most recent period shown: 6/19 Midnight-1AM to 6/26/2014 1-2PM
Kewadin	6/25 3-4PM	6/25 5-6PM	Wet: 3 Span: 3	64.4	0.02	None	None	None	Most recent period shown: 6/19 Midnight-1AM to 6/26/2014 1-2PM
Northport	6/23 9-10AM	6/23 1-2PM	Wet: 5 Span: 5	65.5	0.04	None	None	None	Most recent period shown: 6/19 Midnight-1AM to 6/26/2014 1-2PM
Old Mission	6/23 1-2PM	6/24 8-9AM	Wet: 13 Span: 20	62.5	0.01	Moderate (Symptoms appear: 7/2)	Moderate	Yes	Most recent period shown: 6/19 Midnight-1AM to 6/26/2014 1-2PM
Traverse City (NWMHRS)	6/23 10-11AM	6/23 2-3PM	Wet: 4 Span: 5	69.1	0.02	None	None	None	Most recent period shown: 6/19 Midnight-1AM to 6/26/2014 1-2PM

[Create CSV File From Regional Disease Report](#)

Northwest Disease Report: Most recent wetting event (Report issued 6/26/2014 14:35)

Wetting periods start with rainfall (at least 0.01 inch) and continue until the start of at least eight hours without moisture (rainfall, leaf wetness, high relative humidity). Wetting periods are classified as "ongoing" until eight consecutive dry hours have passed. After that, the official end of the wetting period is recorded (the start of the 8 hour dry period).

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Benzonia	6/25 11AM-Noon	Ongoing. Last hour with moisture: 6/26 11PM - Midnight	Wet: 12 Span: 13	63.8	0.11	Moderate (Symptoms appear: 7/5)	Moderate	Yes	Most recent period shown: 6/18 Midnight-1AM to 6/25/2014 10-11AM
East Leland	6/23 10-11AM	6/23 Noon-1PM	Wet: 3 Span: 3	68	0.03	None	None	None	Most recent period shown: 6/18 Midnight-1AM to 6/25/2014 10-11AM
Eastport	6/23 11AM-Noon	6/23 1-2PM	Wet: 3 Span: 3	69.2	0.01	None	None	None	Most recent period shown: 6/18 Midnight-1AM to 6/25/2014 10-11AM
Elk Rapids	6/25 4-5PM	Ongoing. Last hour with moisture: 6/25 10-11PM	Wet: 5 Span: 7	60.9	0.02	None	None	None	Most recent period shown: 6/18 Midnight-1AM to 6/25/2014 10-11AM
Kewadin	6/25 3-4PM	Ongoing. Last hour with moisture: 6/25 5-6PM	Wet: 3 Span: 3	64.4	0.02	None	None	None	Most recent period shown: 6/18 Midnight-1AM to 6/25/2014 10-11AM
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Cherry fruit fly was observed on leaves at the station last Friday, **20 June**. We have not captured CFF on traps at the station and have not received other reports of CFF capture in the region. **Grape berry moth** (2.5 moths/trap) was detected at the station today, **26 June**.

Temperatures are predicted to be higher on Friday and over the weekend – with highs in the upper 70s to low 80s and lows in the upper 50s and 60s. There is a slight chance of thunderstorms currently predicted for Saturday and Sunday. If the forecast is accurate and we receive rain, growers will need to be protected from diseases prior to rain.

GROWERS NEED TO BE ON THE LOOKOUT FOR BROWN MARMORATED STINK BUG IN MICHIGAN FRUIT

Marguerite Bolt, MSUE Student Intern
Emily Pochubay and Nikki Rothwell, Extension Educators

Life History and Damage

The Brown Marmorated Stink Bug (BMSB), *Halyomorpha halys*, is an invasive insect from Asia that was officially reported in the United States in the 1990s in Allentown, Pennsylvania. Currently, BMSB has been found in 41 states. The first detection of BMSB in Michigan was in 2010 where small numbers of BMSB were found in Berrien County. Last year, BMSB was found in northwest lower Michigan in Leelanau and Grand Traverse counties; a single BMSB was found in both counties. Interestingly, these initial BMSB discoveries in the northwest region were in urban areas – on an ornamental flower and in an apartment, not in orchards, gardens, or other crop plants.

BMSB has over 300 known hosts that include several field crops, vegetable, and fruit as well as ornamental plants. Many of these host plants are commercially grown in Michigan, and we are particularly concerned that this pest may cause economic damage in cherry, peach, apple, pear, and apricot. At this time, infestations are not widespread in Michigan, and since the arrival of BMSB, there has been minimal damage to Michigan crops compared to BMSB damage in other states.

Although BMSB has been observed feeding on leaves, BMSB prefers to feed on fruit, which is why this pest can be particularly damaging in commercial orchards. BMSB is in the family of true bugs that has sucking mouthparts that they insert into plant tissue to extract fluids. When BMSB feeds, the insects inject digestive enzymes that kill surrounding plant cells that results in pithy, sunken or corky areas on both fruit surfaces and internal tissues.

Description and Life Cycle

Distinguishing BMSB from other native stink bugs is critical for growers to determine whether or not management is needed and to determine when to implement management tactics. BMSB is in the shield bug family, Pentatomidae. There are 36 species of Pentatomidae in Michigan and several of them can be easily mistaken for BMSB. Fortunately, key physical characteristics of BMSB can help growers distinguish this pest from native stink bug species.

Adult BMSB are 3/4 to 1 inch in size, gray-brown in color and mottled in appearance. The edges of the pronotum, which can be thought of as the shoulder area located behind and to the sides of the head, are smooth. This characteristic is different from the rough stink bug, a native stink bug similar in appearance to BMSB that has a toothed pronotum versus the smooth edge on BMSB. Additionally, the tips of these 'shoulders' on BMSB are rounded, unlike the brown stink bug and spined soldier bug, which both have pointed shoulders. BMSB antennae can also be used to differentiate this insect from natives. BMSB have alternating light and dark bands on the last two antennal segments.

Adult BMSB overwinter in structures such as residential homes and buildings. BMSB have also been found overwintering in dead or dying trees in woodlots. In the spring, male and female BMSB become active and mate. Females can lay multiple egg masses before she dies meaning she can deposit more than 400 eggs during her lifetime. Eggs are light green in color and laid in masses, typically on the underside of leaves. Orange and black colored first instar BMSB hatch from the eggs and remain clustered on the egg mass. After several days, first instars molt into second instars, become mobile, and begin feeding on host plant tissue (leaves and/or fruit). Nymphs continue feeding, growing, and molting (there are five instars) until adulthood, and the cycle begins again. BMSB produce several broods in a year.

Natural Enemies of BMSB in Michigan

Preliminary results from research currently conducted at Michigan State University in the Organic Pest Management Lab has indicated that spiders, lacewing larvae, and birds prey on BMSB egg masses in Michigan. Parasitism of BMSB eggs was also observed in this ongoing research effort. However, we hypothesize that it is unlikely that Michigan predators and parasitoids will keep BMSB populations in check. In Asia, several parasitoid wasp species and flies parasitize BMSB.

Monitoring

In 2011-2012, Michigan State University Extension fruit educators, researchers and specialists began conducting a statewide monitoring program for BMSB. In 2013, this statewide monitoring network expanded to include more Michigan counties. In previous years, black light traps placed adjacent to crop fields or along the field perimeter were used to monitor for BMSB. This season, the monitoring team is using traps baited with an aggregate pheromone to capture male and female BMSB in small fruits and tree fruit across the state. Traps are placed adjacent to or along orchard perimeters to intercept BMSB. First detection of BMSB and regular updates on BMSB trap catch densities for all monitoring sites throughout the state will be reported weekly at the MSU Extension News for Agriculture website.

Management

BMSB has the potential to be a devastating pest because every active life stage (2nd instar – 5th instar nymphs and adults) can feed and complete its entire life cycle on the same host plant. In Michigan, BMSB will likely have only one generation per year. At this time, we have not found BMSB in commercial orchards, thus control measures have not been warranted. If BMSB are detected in an orchard, control may be necessary. Fortunately, for BMSB management in tree fruits, a number of insecticides including methomyl and several pyrethroid insecticides have demonstrated high activity on BMSB nymphs and adults. Neonicotinoids have shown activity with a direct spray to BMSB adults and by ingestive exposure to nymphs. It is also possible that current insecticides and tactics in IPM programs may provide some overlap for BMSB control. However, applications targeting BMSB should not be made unless a problematic population is detected. Be sure to read and follow information on insecticide labels.

Please follow MSU Extension News for Agriculture articles for timely updates regarding this pest and refer to the E-154 bulletin: Michigan Fruit Management Guide 2014 for more information on BMSB and management.

Pointed
shoulders

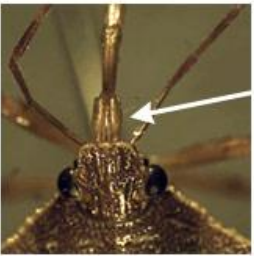


Rounded
shoulders

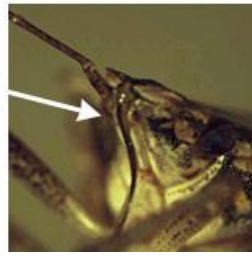
Spined Soldier Bug

BMSB

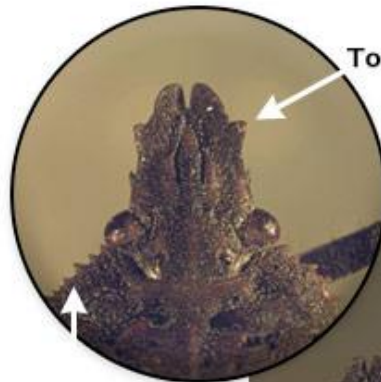
Short, thick
nose segment



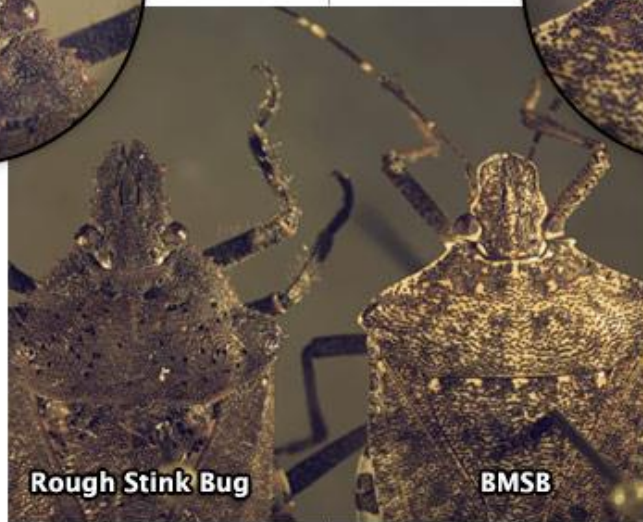
Long, slender
nose segment



Tooth



Spines
on
shoulder



Rough Stink Bug

BMSB

No tooth



No spines
on
shoulder



Brown stink bug, *Euschistus servus*, from above. Photo by Russ Ottens, University of Georgia, Bugwood.org



Brown Marmorated Stink Bug, adult male from above. Photo by W. Hershberger