Hail Damage and Grapes

On July 14, 2014 a slow moving thunderstorm traveled across a small portion Door Peninsula that caused considerable crop damage. The storm deposited approximately 3 inches of hail that accumulated on the ground. The hailstones were approximately dime sized. What was most significant is that the hail storm lasted approximately 35 minutes. The hailstorm was approximately 2 miles wide and it traveled directly over the Peninsular Agricultural Research Station. At the time of the storm, the grapes were approximately buckshot size in the grape variety trial. The hail removed most of the grape berries from the clusters or severely damaged berries that remained attached to the clusters. Considerable damage also occurred to shoots and leaves. Most shoots that were high in the trellis system sustained severe damage to the cambium and most leaves were removed or heavily tattered. Although damage to the shoots vascular system did not appear immediately after the hailstorm, damage was more pronounced a few days later.

Management after Hail Damage
The type and degree of management of hail damaged vines is dependent on the stage of development of the vines at the time of damage.
In our case, most of the berries were removed by the hail. Most grape cultivars in the grape variety trial have less than 10% of a crop remaining. The only cultivars that have a larger crop are Marquette, La Crosse, and La Crescent. These cultivars have a larger crop because of a well established canopy compared to other cultivars before the hailstorm. The larger canopy helped deflect the hailstones away from the grape clusters. Since almost all of the berries were removed by the hail on most cultivars, efforts will not be expended to reduce the crop load. If the hail had only removed a small portion of the crop, crop load would have been adjusted to match the canopy.

Besides damage to the berries, shoots were also severely damaged. This damage is prone to fungal infections, especially by botrytis (Botrytis cinerea) which can colonize both dead and living grape tissues. A cover spray should be applied to hail damaged grapes to reduce or prevent the incidence of botrytis infections. Another pathogen of concern to hail damaged grape vines is crown gall (Agrobacterium vitis). Infection by crown gall is initiated at sites that have been injured. When grapes are mechanically injured or wounded, the wound sites release both sugars and phenolics that stimulate the infection process by crown gall. For crown gall susceptible grape cultivars such as Leon Millot, severely hail damaged shoots should be pruned out to reduce the number of potential infection sites.

Response of Grape Vines after Hail Damage
Three weeks after the grapes vines were damaged by hail shoot growth has been severely reduced. Lateral shoots range in length from 4 to 12 inches. Typically undamaged vines will produce more than 12 inches of shoot growth a week during this time of year. On many of the cultivars in the grape variety trial the canopy has been reduced severely. Our concern is that the grape vines have a limited time to produce a full canopy before a killing frost. It is too late in the season to stimulate vegetative growth with nitrogen fertilizer. These same vines experienced severe cold during the winter of 2013-14. Going forward, during the 2015 season, the crop load will be reduced to maintain vine health and architecture.
Development of wine grapes in the grape variety trials at the Peninsular Agricultural Research Station (PARS) Sturgeon Bay, WI and West Madison Agricultural Research Station (WMARS), Madison, WI
Development of wine grapes in the grape variety trials at the Peninsular Agricultural Research Station (PARS) Sturgeon Bay, WI and West Madison Agricultural Research Station (WMARS), Madison, WI

La Crescent at PARS 7.16.14

La Crescent at WMARS 7.14.14

La Crosse at PARS 7.16.14

La Crosse at WMARS 7.14.14

Marquette at PARS 7.16.14

Marquette at WMARS 7.14.14
Development of wine grapes in the grape variety trials at the Peninsular Agricultural Research Station (PARS) Sturgeon Bay, WI and West Madison Agricultural Research Station (WMARS), Madison, WI
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La Crescent at PARS 8.4.14

La Crescent at WMARS 8.4.14

La Crosse at PARS 8.4.14

La Crosse at WMARS 8.4.14

Marquette at PARS 8.4.14

Marquette at WMARS 8.4.14
Development of wine grapes in the grape variety trials at the Peninsular Agricultural Research Station (PARS) Sturgeon Bay, WI and West Madison Agricultural Research Station (WMARS), Madison, WI

**2014**

- Petite Pearl at PARS 8.4.14
- Petite Pearl at WMARS 8.4.14
- Aromella at PARS 8.4.14
- Leon Millot at PARS 8.4.14
- Vignoles at PARS 8.4.14
- Noiret at PARS 8.4.14
Development of wine grapes in the grape variety trials at the Peninsular Agricultural Research Station (PARS) Sturgeon Bay, WI

MN 1189 at PARS 8.4.14

MN 1200 at PARS 8.4.14

MN 1220 at PARS 8.4.14

Wild grape at PARS 8.4.14
Degree Day\(^1\) (base 50) Accumulation from April 1 to July 28, 2014 at Peninsular Agricultural Research Station in Sturgeon Bay, WI

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<th>Date</th>
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<th>2013</th>
<th>5 Year Average(^2)</th>
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\(^1\)Modified method.  
\(^2\)Average from 2009 to 2013.

Degree Day\(^1\) (base 50) Accumulation from April 1 to July 28, 2014 at West Madison

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\(^1\)Modified method.  
\(^2\)Average from 2009 to 2013.

Accumulated degree days\(^1\) (base 50) for the month of March in Sturgeon Bay and Madison, WI.

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\(^1\)Modified method.  
\(^2\)Data from http://www.doa.state.wi.us/degreedays/

Please scout your vineyards on a regularly scheduled basis in an effort to manage problem pests. This report contains information on scouting reports from specific locations and may not reflect pest problems in your vineyard. If you would like more information on IPM in grapes, please contact Dean Volenberg at (920)746-2260 or dean.volenberg@ces.uwex.edu.