Phenology Updates

**Hudson Valley:** Veraison

**North Country:** Veraison

Pest Updates

**Hudson Valley**

Drosophila flies are present in Hudson Valley vineyards. The common *Drosophila melanogaster* frequently finds its way into grapes damaged by birds. Spotted wing Drosophila (SWD), though not as common a problem in grapes as in other small fruits, can still pose a threat to ripening grapes. Malathion (57% and 8 Aquamul) is labeled for all Drosophila. Other insecticides (e.g. Delegate, various pyrethroids) have a 2EE label for SWD.

Brown marmorated stink bug (BMSB) populations have been on the rise lately in the vineyard at the Hudson Valley Lab. Insecticide treatments may be necessary if BMSB causes enough injury to the grape clusters. Leverage 360 and Baythroid XL both have short PHI’s.

Downy mildew and botrytis are still around. It is important to closely monitor vineyards for these diseases, as pressure can build suddenly in cooler, wetter weather.

Sour rot is also a concern during cooler, wet weather. See Veraison to Harvest Issue #2 for an article from Wayne Wilcox where he discusses what it is and what growers may expect for the 2014 harvest season.

**North Country**

At the Willsboro Farm pest pressure has been relatively low. Netting has excluded most of our avian friends, despite an occasional bird finding a way to get underneath. A low solar-powered electric fence (1 ½') was installed last week to deter raccoons from burrowing under the deer fence to get into the planting. The warm, dry weather this week has minimized disease. So far there has been no evidence of GBM.

Please consult the 2014 New York and Pennsylvania Pest Management Guidelines for Grapes for more information, including application rates.

Feel free to contact your local ENYCHP Grapes Specialist if you have any questions on your vineyard. We’d be happy to assist you in any way that we can.

North Country: Anna Wallis at 443-421-7970 or email aew232@cornell.edu

Hudson Valley: Jim O’Connell at 845-691-7117 or email jmo98@cornell.edu.
Petiole sampling can be a valuable tool for grape growers when it comes to nutrient management in the vineyard. By itself, it can allow a grower to address nutrient deficiencies as a corrective measure. In combination with a soil test, it can serve as a proactive approach to vineyard fertility management.

Agro-One, a division of Dairy One is the analytical lab that I recommend to growers, because Cornell interpretation and guidelines are provided with the results. More information, including submittal forms can be found here: http://dairyone.com/analytical-services/agronomy-services/plant-tissue-testing-services/

Below is a list of other labs that also offer tissue analysis (i.e. petiole analysis):


Spectrum Analytic http://www.spectrumanalytic.com/ 1-800-321-1562

Penn State Agricultural Analytical Services Lab http://agsci.psu.edu/aasl 814-863-0841

The Finger Lakes Grape Program has put together a YouTube video about petiole sampling. https://www.youtube.com/watch?v=lrwpQWUEQKw

See the article which follows from the University of Minnesota which details sampling, including images of what leaves to sample. ~JMO

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**Petiole Analysis as a Guide to Grape Vineyard Fertilization**

By Carl Rosen, Univ. of Minnesota Department of Soil, Water and Climate, http://fruit.cfans.umn.edu/grapes/production/petiole-analysis/, revised 8/28/08.

**Principles of Tissue Analysis**

The basis behind tissue analysis is that optimum ranges exist for the level of each nutrient in plant tissue and maximum quality/yields occur when nutrients are maintained within these ranges. If the level of a nutrient falls outside of its optimum range, corrective measures should be taken.

Many factors affect the nutrient composition of plant tissue. Soil moisture, soil texture/structure, native soil fertility, and fertilizer practices have direct effects on nutrient uptake. Crop load, variety, rootstock, disease and insect incidence, weather conditions, and cultural practices such as weed control and pruning can also alter tissue nutrient composition. Whenever possible, consideration of these factors should be taken into account when interpreting tissue analysis results. Fertilizer application is often necessary to provide optimum levels and balance of nutrients for plant growth, but fertilizer cannot make up for poor insect and disease control or correct problems like severe damage due to winter injury.

Petioles (stem portion of the leaf, see Figure 1) are the tissue recommended for determining the nutritional status of grapevines. In most other fruit crops, the entire leaf is used, but research has shown that petiole tissue is best for grapes. When used properly, petiole analysis provides the most reliable method to determine fertilizer needs for established vineyards. Soil tests should be used prior to planting to determine organic matter and pH levels, lime requirements, as well as phosphorus, potassium, magnesium and micronutrient needs. In established vineyards, however, soil tests are primarily used as a supplement to tissue analysis information. The table below provides the nutrient sufficiency levels established for grape petioles from established vines.

*Continued on next page*

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**Figure 1. Grape leaf showing blade and petiole. Keep the petiole for analysis and discard the blade.**
Recommended Procedures for Sampling and Handling Grape Petioles

Obtaining a representative sample is important to avoid misleading results and erroneous interpretations. Even the best-equipped laboratory cannot make up for a poorly collected or improperly handled sample. Optimum nutrient ranges are based on petioles sampled at a specific maturity level and collected at a specific period during the growing season. The following guidelines should be used for proper sampling and handling procedures:

1. For grapes, there are two times of the season recommended for testing – full bloom and early veraison. While both sampling periods have established sufficiency levels, the mid-July to mid-August timing is generally thought to provide a more accurate assessment of grapevine nutrient status.

2. At least 25 to 50 vines should be selected for sample collection. Vines not typical of the vineyard should be avoided.

3. Vines should be of the same age, variety, and rootstock, growing on a relatively uniform soil of the same fertility. If these conditions are not met, divide the vineyard into uniform blocks and sample separately.

4. For full bloom time sampling, take the petioles from leaves opposite the bottom flower cluster (Figure 2). For samples collected in early veraison, take petioles from the most recently developed matured leaf (Figure 3).

5. Collect a total of 75 to 100 petioles (more may be required from cultivars with short petioles) from 2 or 3 leaves on the vine. Do not pick more than 1 leaf from any one shoot. Discard the blade and keep the petiole. Leaves showing insect, disease, or mechanical damage should not be selected for sampling.

6. If you are trying to diagnose specific symptoms, send in two samples – one set of 75-100 petioles from vines showing the symptoms and another set from vines not showing symptoms. This can be done at any time of the growing season.

7. If petioles are dusty or dirty, they can be rinsed in distilled or deionized water. Do not let petioles soak in water, because nutrients will leach out. Dried petioles should not be washed.

8. Place petioles in a clean paper bag and dry at room temperature or send immediately to a laboratory. Do not use plastic bags unless samples have been previously dried.

Figure 2. Select petioles from leaves opposite basal cluster at full bloom.

Figure 3. Select petioles from the most recently developed mature leaf in mid-July to mid-August.
Fruit Maturity Monitoring at Willsboro

By Anna Wallis and Lindsey Pashow, CCE ENYCHP

At this point in the season, grapes of all varieties have reached veraison. Now is a great time to start monitoring for harvest. Sampling should be done every 7-10 days, and increase in frequency to every 2-3 days closer to harvest. It is best to sample by 10AM, before the hottest part of the day. Approximately 200 berries should be randomly selected to include berries from many different clusters in various parts of the canopy.

Measurements that should be considered include sugar content (soluble solids), pH, flavor, aroma, TA (titratable acidity), juice color, tannins, and seed color. But the most common and important qualities to test are pH, TA, and sugar. The maturity indices can be easily kept in a simple table. Having these records will help you monitor your crop this year and compare maturity across seasons.

Sample Fruit Monitoring Chart

<table>
<thead>
<tr>
<th>Date</th>
<th>Variety &amp; Location</th>
<th>Flavor</th>
<th>Aroma</th>
<th>SS</th>
<th>TA</th>
<th>pH</th>
<th>Tannins</th>
<th>Juice Color</th>
<th>Brown Seeds (%)</th>
<th>Notes</th>
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</thead>
</table>

At Willsboro, we have started monitoring the sugar content of the berries. Sugar content, measured as °Brix, is measured using a device called a refractometer that measures the concentration of soluble solids – i.e. the amount of sugar dissolved in the juice.

Harvest time will depend on many factors including region, seasonal conditions, and vineyard management. It will also depend on the type of wine you will be producing—a sweeter wine starts with juice containing more sugars and lower in acidity.

It will also differ by variety. Each has a unique target reading and will mature at its own rate. For instance, Edelweiss should not be harvested past 15°Brix or it will start to acquire a foxy or musky aroma that will be transferred to the wine. Marquette and La Crescent, on the other hand, should not be harvested until they have reached much higher sugar content.

Below is a table of current and target brix readings for the varieties at the Willsboro farm. Sugar content will continue to be monitored on a weekly basis until harvest. As sugar content will vary based on vineyard location and management, it is best use these measurements as a guide, but make sure to take measurements of your own vineyard.

Brix Measurements at Willsboro Farm

<table>
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<th>Variety</th>
<th>Target</th>
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<th>3-Sep</th>
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<tr>
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<tr>
<td>La Crescent</td>
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<td>Louise Swenson</td>
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<td>Vignoles</td>
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</table>

Marquette at veraison. Image by AW
Weather and Grape Ripening

By Tim Martinson, Cornell University Dept. of Horticulture

It’s been a cool and rainy summer, and if you believe the mid and long-range forecasts, cooler than average temperatures could return in September, thanks to the irregular Polar Vortex that dipped down into the Midwest and Northeast last winter. Accuweather, in an article entitled Polar Vortex to Return Early in the Northeast, says this: "The vortex could slip at times, maybe even briefly in September for the Northeast," AccuWeather Lead Long-Range Forecaster Paul Pastelok said. "There could be a significant shot of chilly air that comes across the Great Lakes region and into the interior Northeast sometime in mid- to late-September."

The Northeast Regional Climate Center (Figure 1) recorded cool August temperatures, which has apparently delayed veraison in some parts of NY from mid-August to the end of August.

![Figure 1. August precipitation was below average in Eastern NY but well above average in the Finger Lakes. August temperatures were 1 to 2 degrees F cooler than average. Figure by Northeast Regional Climate Center.](image)

Growing degree-day accumulations (Table 1) show 2014 to be the second coolest season to date in the past seven at Marlborough, NY. 2009, which I remember as a challenging year for ripening grapes, was cooler.

So should Hudson Valley growers be worried about the impact on grape ripening? To answer this question let’s look at what happens when grapes ripen.

Processes during ripening
Before veraison, berries are hard and green. They have gone through two periods of growth – the first being cell division phase, and the second being a cell enlargement phase. They are separated by what is called the ‘lag phase’, a period in which cell growth pauses, and seed formation occurs. Malic and tartaric acid are produced before veraison, and reach their maximum concentrations around veraison.

Veraison signals a major biochemical shift, in which berries begin accumulating soluble solids (sugars). They soften, take on water and sucrose produced and transported from the leaves through the phloem to the berry. Xylem vessels become inactive.

Sugars
The sucrose imported into the berry is cleaved (hydrolysed) into its component sugars glucose and fructose (relative levels of these two sugars can be important during fermentation). The amount and concentration of sugars accumulated is related to a number of factors such as cropping levels, disease status, etc. But ultimately sugars produced and accumulated during ripening depend directly on photosynthesis and the amount of active (i.e. exposed to sunlight) leaf area relative to the amount of fruit.

![Table 1. Seasonal growing degree accumulations at Marlborough, NY on October 3, from 2008 to 2014.](image)
Acids
Two major acids, tartaric and malic, are present, and their levels drop as grapes ripen. Malic acid is metabolized to produce energy for metabolic processes in the grapevine (Some of you may remember that it is an intermediary in the Krebs or TCA cycle that provides energy through aerobic respiration), and tartaric acid can also be used, but is more conserved. The amount of acid consumed is related to temperature – in part because biochemical reactions are temperature dependent. They go faster at higher temperatures.

Other compounds
Many aroma compounds (eg. terpenes, important in aromatic whites) accumulate slowly during ripening, and tend to be sensitive to temperatures. Its thought that higher temperatures volatilize some of these compounds, so cool ripening conditions favor their retention.

Weather Impacts and berry composition
Cool years tend to also be cloudy years in New York. So typically in cool years we see lower sugars (brix) at harvest and higher acids. Conversely in warm years (eg. 2010 and 2012), we often see much more sunlight, together with the heat. These years we tend to have high brix levels and low acidity. The year 2011 was an exception, where above-average temperatures combined with lots of cloud cover and something like 21 days of measurable precipitation between veraison and harvest. So we saw lower brix levels at harvest (less sunlight) AND low acidity (driven by heat).

Trends 2009-2013
So far, 2014 looks a lot like 2009. Figure 2 shows the weekly brix and Titratable Acidity averages for Cabernet franc and Riesling from 2009-2011. Note that in 2009 (our coolest and cloudy year), brix accumulations lagged a few weeks behind the other years, but eventually ‘caught up’ by harvest. Titratable acidity, however, ended up 2 to 3 g/l higher than in the other years. In warm and sunny 2010 and 2012, brix levels started up high, and ended up higher than average for both Riesling and Cabernet Franc. In 2011 (cloudy and warm), brix accumulated at an average rate, but acids dropped faster than average. So our best guess for the weather’s influence on ripening this year is that sugar accumulations will be delayed, and acidity will be higher than average.
Management implications

- If the season lasts long enough, the reasonable management option is to harvest later than average, i.e. ‘let em hang’. As long as the grapes do not start breaking down, waiting a week or two longer might bring acids and sugars in range. As a winemaker, I’d look more carefully at TA than brix as my maturity indicator.

- Sunlight exposure to clusters. Its late in the season for leaf removal, but increasing sunlight exposure to grape clusters is one of the few levers growers have to influence acidity. Unshaded clusters are warmer clusters.

- Watch downy mildew. Healthy foliage is the most important in ripening grapes. In moderately cool and rainy weather, downy mildew can defoliate vines within a matter of days.

- Winemaking interventions. Winemakers should be prepared for fruit with different composition, and be prepared to adjust acids, and possibly do other interventions (eg. thermovinification, increased skin contact for whites) to enhance extraction of flavor-active compounds.

- Impact on winter hardiness and return crop: Unless the vine is heavily overcropped (not the normal case this year) and season ends abruptly and early, the impact on vine hardiness and return bloom should be minimal.

My final words of wisdom: A week or two of sunshine and dry weather in September can make a lot of difference, even when the summer development has been delayed. Let’s hope for some sunshine over the next few weeks.

**The “Ag Exchange” – Boosting Business for Local Agriculture**

Now open, the “Ag Exchange” at [http://agexchange.cce.cornell.edu](http://agexchange.cce.cornell.edu) by Cornell Cooperative Extension ([http://ccecapitalregion.org](http://ccecapitalregion.org)) is a new and simple online agricultural classified service and ag business directory. Through this one exchange farmers in the mid- and upper Hudson Valley will be able to buy, sell, or rent any agriculture-related product or service. Property owners will also benefit since it includes land and facilities rental. It is not for retail sales.

The Ag Exchange classified is designed to facilitate wholesale business among our traditional dairy, beef, field crop, fruit or vegetable farms, bees and maple, as well as the new and developing farms involved in brewing, distilling, artisan products, organic production, and non-GMO animal feeds.

The Ag Business Directory portion is provided for commercial ag businesses to list their contact information and a link to their website. Along with our traditional machinery and feed dealers, smaller businesses, from hoof trimming to fencing, can also be listed to advertize their products and services. Businesses are asked to make an annual donation to support CCE and the Ag Exchange and to link the CCE regional website to their homepage.

The Ag Exchange is an easy to use, blog-based system. No password is required and you do not have to create any “accounts”. To look for a product or service, simply click on the category you want. To post an ad onto the Exchange, simply read the “terms of use for the Ag Exchange”; click on the button “Post Ad”; select the county you are from; select the category for your ad; and enter the appropriate information. You can also post images of your item. Before your classified or directory listing is posted to the web, you will receive an email to confirm you are the person making the post to the Ag Exchange. It is very simple.

Local agriculture is very active. Many farmers have been asking for a service like the Ag Exchange. It may include other regions of New York beyond the mid- and upper Hudson Valley once it gets established. It will be a great boost for all farms in the local agricultural community.

To use the Ag Exchange, go to [http://agexchange.cce.cornell.edu](http://agexchange.cce.cornell.edu).

If you have questions or comments, please contact:
Aaron Gabriel, (adg12@cornell.edu, 518-746-2560) or
Amy Sabbatis, (als77@cornell.edu, 518-668-4881).
Tasting for Terroir in Cold Climates


Harvest is closing in fast and winery tasks are in high gear, whether it be crush pad prep or the bottling of last year’s vintages. From large producers to little amateur outfits like our own, the story is the same as one season rolls quickly into the next, and what comes in through one door must pass out another and make room in between. While I was bench testing blends for the 2013 whites, I got to thinking about a very interesting and informative cold-climate tasting from earlier this summer, when it seemed like we still had all the time in the world.

A couple of dozen local wine producers and advocates from around the Lake Champlain Valley convened in Burlington, VT for a “Cultivar X Region” tasting sponsored by the Northern Grape Project and coordinated by the University of Vermont Grape Program and the Cornell Enology Extension Lab. Several flights of experimental wines were lined up to include five grape varieties sourced from five different sites, tested with several selections of yeast during fermentation. As far as we know this was the first formal comparative tasting of its kind in the region, and it certainly piqued interest in having more like it.

Most of the plots where these grapes were grown are products of the NE 1020 Project which helped fund the planting of cold hardy trial vineyards: University of Vermont, University of Minnesota, and in New York at Geneva in the Finger Lakes, Willsboro in the Lake Champlain Valley, and Clayton in the Thousand Islands of the St. Lawrence river. The grapes were fermented according to a standard protocol at Cornell and in Minnesota, and I felt quite fortunate to be able to see the variations side by side, while tasting alongside a number of folks who are pioneers with these grapes. The format was single blind, so we knew what the variety was, but not where from, nor what kind of yeast was employed.

Terry Bradshaw from UVM opened with a situation introduction and orientation, and I’m grateful that he and his UVM crew were able to host us in what turned out to be a great central location. Tim Martinson, Senior Cornell Extension Associate, and Northern Grapes Project leader offered a few minutes of explanation about the background of the NE1020 and the Northern Grape Project and made the important point that this tasting was a milestone of sorts, the actual fruition of those first experimental plantings years ago. Anna Katherine Mansfield and Christopher Gerling led the tasting flights and were responsible for the big reveal after all of us had handed in our assessment sheets, ranking the flight of wines in order of preference. Anna and Chris are a dynamic duo and I’ve consistently been both educated and entertained by their presentations, and this time was no exception. Each tasting round offered one variety from two or three sites using two or three different yeasts. We had a few minutes to take notes and rank our selections before we handed in the data sheets and were then allowed to discuss what we had tasted and the identities of the wines were revealed.

We passed through a white flight of Prairie Star, and two more of La Crescent before moving on to a few red flights of Frontenac, Marquette and St. Croix. These were all grapes that I was familiar with, so novelty was not a factor, and maybe that’s why the aspect of site seemed to show through so clearly. Maybe it was the conditioning of our palate… I’ve been making cold hardy wines from the Baker Farm trial for several years now. Maybe it was the company. Lindsay Pashow the field tech at Willboro was there and had asked me to sit with her. We are waiting on the full tabular data from the event to be distributed, but based on my notes, I had a freaky experience over several flights of wine. I consistently chose the Willsboro trial wines as my most preferred, as #1 and #2 each time except for the very first flight of Prairie Star where preference followed the yeast selections and the Willsboro wines came in #1 and #3.

I’m not saying that I recognized the wines as “Willsboro”, but I do know that they appealed to me more than the others. There was a distinct brightness and clarity to the flavor profiles of the Willsboro wines, which did not come through in the other New York sites, while the UMN wines leaned towards the vegetal and slightly reductive. The Baker Farm vineyard in Willsboro, really is an excellent site for wine growing, and I have to believe that the strength of the location had a direct impact on the fruit quality and resulting wines.

Lab-made wines are a little funny to sample because they have not been made to extract the finest possible product from the process, but rather, they all are treated with the same wine making tasks and parameters, in order to isolate the variance that comes with intuitive human touch. Lab wines are not generally quaffable, and while this year’s batch had followed the same production rules as in previous years, I did comment that the wines are getting better and approached commercial quality in several cases. The wine labs themselves may be maturing and subtly raising the bar, but that compliment would suggest that there is some change in consistency and the scientists might not like that. So I’m going to stick with the site and say that as the vineyard grows up, so grows a quality that is distinct enough to taste.
Wine Grape Harvest Workshop

Harvest season for grapes is fast approaching in northeastern NY! Cornell Cooperative Extension will be offering a workshop for interested folks in the area to learn the process and logistics of grape harvest. The event will be held at the Willsboro Research Farm, where we have an extensive planting of 16 varieties of cold climate grapes.

With grape harvest, comes grapes! Many of the grapes will be transported to Cornell where they will be used in a research program associated with universities across the northeast. But there will also be an abundance of grapes available for participants to take home!

Harvest date will depend on how quickly the fruit matures. A specific date will be announced closer to harvest. Based on previous seasons and current maturity measurements, we anticipate a full 2-3 days during the last week in September.

If you are interested please contact Anna Wallis (443-421-7970 or email aew232@cornell.edu) or Lindsey Pashow (518-572-9186 or email lep67@cornell.edu). And we’ll be in touch as plans unravel!

More about the Willsboro planting

Our wine grape trial at Willsboro was planted in 2005. All 300 vines (excluding Prairie Star) are trained to a single trunk bilateral upper cordon system at 8’ in row x 10’ between rows. The vineyard's soils were developed in glacial till (Bombay) (current pH 6.5). The vineyard is located on the Cornell Baker Farm property, 1.5 miles north of the town of Willsboro, NY on the Willsboro Point peninsula of Lake Champlain at an elevation of about 180 feet and a latitude of 44 o 23’ and at a longitude of 73 o 23’. It overlooks the Lake and the Green Mountains of Vermont to the east. The climate in the area is characterized as cool temperate with a 150 day growing season.

Erik Schellenberg to Facilitate GAPs Programming in Eastern New York Region

Erik Schellenberg is a New York native, who recently returned after completing graduate school in Canada for natural resource management. His background in environmental impact assessment, ecological agriculture, and vegetable farming provide him with the knowledge and experience necessary to work with and relate to farmers. Erik is filling a grant funded position aimed at facilitating the GAPs certification process for vegetable farmers in the ENY Team area with special focus, reflecting the interest of the funder, in the Albany-south area, plus Sullivan, Rockland and Westchester. To that end, he will be leading educational sessions to help producers better understand and work through GAPs certification and will also be available for farm visits to help producers work through their customized GAPs plans and address any issues before the plans are audited by the state.

Need GAPs Help?

If you want help with writing your GAPs plan or need to get ready for your first inspection, contact Erik Schellenberg (jk2642@cornell.edu). He is prepared to help you take the next steps needed to get that inspection and to be GAPs certified.

This fall, we plan on having more 2-day classes, across the region for those who have yet to get started with their plans or investigating “what it takes”.

Please call 845-344-1234, and ask for Erik, if you have questions or want to book an appointment with him.
**Eastern NY Commercial Horticulture Website**

For on-line class registrations, announcements, older issues of our newsletters, and more, please visit the ENYCHP’s website at [http://enych.cce.cornell.edu/](http://enych.cce.cornell.edu/). We hope you bookmark it on your computer and begin using it as your ‘go to’ website for production and marketing information.

Email or call any of the educators with questions or comments on the website – we want to make it work for YOU!

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**2014 Weather Table**—This chart is compiled using the data collected by Northeast Weather Association (NEWA) weather stations. For more information about NEWA and a list of sites, please visit [http://newa.cornell.edu/](http://newa.cornell.edu/). This site has information not only on weather, but insect and disease forecasting tools that are free to use.

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<thead>
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<th>Site</th>
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<th>2014 Season Total 3/1 - 9/7</th>
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<th>2014 Season Rainfall 3/1 - 9/7 (inches)</th>
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