Wisconsin Fruit News

Volume 1 Issue 9 – August 5, 2016

Events this Week

August 10, 2016 – Cranberry Growers Summer Field Day
Brockway Cranberry, Black River Falls, WI

August 15, 2016 – Urban Horticulture Day
10 am – 2 pm; West Madison Agricultural Research Station, Verona, WI

General Information

UW-Madison/Extension Plant Disease Diagnostic Clinic (PDDC) update

By: Brian Hudelson, Sean Toporek, and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from July 23, 2016 through August 1, 2016.

PLANT	DISEASE/ DISORDER	PATHOGEN	COUNTY
Apple	*Cork Spot*	*None*	*Oneida*
	Cedar-Apple Rust	*Gymnosporangium sp.*	*Dane, Eau Claire*
	Chemical Burn	*None*	*Dane*
	Root Rot	*Phytophthora sp., Pythium sp.*	*Shawano*
Blackberry	*Botryosphaeria Cane Canker*	*Botryosphaeria sp.*	*Rock*
	Septoria Leaf Spot	*Septoria rubi*	*Taylor*
Pear	*Entomosporium Leaf Spot*	*Entomosporium sp.*	*Oneida*
	Chemical Burn	*None*	*Dane*
Raspberry	*Anthracnose*	*Sphaceloma necator*	*Sheboygan*
	Raspberry Leaf Spot	*Cylindrosporium rubi*	*Price*
	Verticillium Wilt	*Verticillium sp.*	*Sheboygan*

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

UW-Madison/Extension Insect Diagnostic Lab update

By: PJ Liesch

The following insects were reported to the Insect Diagnostic Lab (IDL) as being active in the state between July 22nd and Aug 4th, and have the potential to impact fruit production in the region. If you would like more information about the UW Insect Diagnostic Lab, you can visit our website.

-Japanese Beetles are out in full force and will continue to be present for several weeks. Of interest for growers in the northern part of the state is a report from the Spooner area in Washburn County. Japanese beetles are abundant in the southern portions of the state, and this detection in Washburn County is one of the northern-most detections in Wisconsin. Most of the reports of fruit damage at the UW Insect Diagnostic Lab have been on raspberries, grapes, and apples.

-Brown Marmorated Stink Bug nymphs continue to be spotted in Dane county and a single nymph was recently spotted on the east side of Madison, several miles from earlier reports. Growers should be on the lookout for juveniles and adults in the coming weeks. For more information about monitoring for brown marmorated stink bug in Wisconsin, please see the article on pages 17-18 of this issue of the newsletter.

-Second generation **codling moths** are active and growers with pheromone traps will be able to monitor for their activity. A number of reports of codling moth damage from first generation caterpillars have come in from backyard growers in the state.

-Spotted Wing Drosophila reports have started to trickle in to the UW Insect Diagnostic Lab. Growers of berry crops, especially raspberries and blackberries should be keeping an eye out for this pest. We have addressed spotted wing drosophila monitoring and control many times in pervious issues of this newsletter: for information on chemical controls, please see Issue 5, pages 4-5; for information on exclusion control with high tunnels, please see Issue 6, pages 3-6; and for information about which raspberry varieties are least susceptible to spotted wing drosophila, please see Issue 4, pages 3-6.

The following insect was previously reported to the Insect Diagnostic Lab (IDL), as being active in the state between July 8th and July 21st:

-Grape Phylloxera has been confirmed on several grape samples sent in to the IDL. Important considerations for phylloxera include variety/rootstock selection. For more information on grape phylloxera, please refer to the Grape section of previous issues of this newsletter, for example Volume 1, Issue 6, page 18.

Leaf tissue analysis for berry crops - now is the time

By: Amaya Atucha, UW-Extension State Fruit Specialist

Leaf tissue analysis is the best indicator of plants' nutritional status as it measures directly the concentration of nutrients in the plant. Soil testing can be a useful tool as well; however, results of a soil test do not always correlate with the amount of nutrients that plants are actually up-taking. A good recommendation for growers is to take foliar samples on an annual basis and a soil test every 3 years.

Foliar nutrient analysis is the best way to assess the effectiveness of your fertility program, as it allows growers to detect when nutrient levels in the plant are approaching deficiencies, before visual symptoms are observed, and allowing growers to take corrective action in advance. The analysis provides information on N, P, K, Ca, Mg, Fe, B, Mn, and Zn levels in leaves sampled, and a guideline with the concentration range for these nutrients expected in healthy plants.

When and how should I collect the leaf samples?

The standard recommendation for foliar sample collection is mid-summer because during this time of the year nutrient levels are most stable in the plants. For blueberries, 80 to 100 leaves should be collected from the middle section of shoots (not old leaves from the base, nor new leaves from the tip), selecting newly matured leaves that are fully exposed to the sun. For blackberries and raspberries, collect a minimum of 50 fully expanded leaves from primocanes (non-fruiting canes). For strawberries a minimum of 50 leaves should be collected from the first fully expanded leaves after renovation.

A general recommendation is to collect the leaves across the planting in a zigzag pattern. For the main sample, leaves should be sampled from plants that are representative of the entire field, but separate samples should be collected from areas where plants have poor growth or present visual symptoms of nutrient deficiencies.

Once you have collected the leaves, gently wash them with distilled water to rinse off soil and spray residues, and let them air dry. Place the leaves in a clearly labeled paper bag and send them to the lab. If you cannot wash the leaves after collecting them, place them in a cooler or refrigerator until you can process them (do not allow leaves to wilt before you wash them).

As a reference, we have provided tables below with the desired range of nutrient concentrations for blueberries, caneberries, and strawberries.

Critical nutrient foliar concentration for Blueberry (source: Penn State University):

Element	Deficient	Below Normal	Normal	Above Normal	Excessive
N (%)	1.65	1.7	1.9	2.1	>2.1
P (%)	0.05	0.06	0.1	0.18	>0.18
K (%)	0.35	0.4	0.55	0.65	>0.65
Ca (%)	0.35	0.4	0.6	0.8	>0.80
Mg (%)	0.18	0.2	0.25	0.3	>0.30
Mn (ppm)	45	50	250	500	>500
Fe (ppm)	65	70	200	300	>300
Cu (ppm)	4	5	11	15	>15
B (ppm)	29	30	40	50	>50
Zn (ppm)	14	15	25	30	>30

Critical nutrient foliar concentration for Brambles (source: Cornell University):

Element	Deficient	Below Normal	Normal	Above Normal	Excessive
N (%)	1.80	2.00	2.50	3.00	>3.00
P (%)	0.23	0.25	0.35	0.40	>0.40
K (%)	1.45	1.50	2.00	2.50	>2.50
Ca (%)	0.57	0.60	1.70	2.50	>2.50
Mg (%)	0.27	0.30	0.70	0.90	>0.90
Mn (ppm)	45	50	150	200	>200
Fe (ppm)	48	50	150	200	>200
Cu (ppm)	6	7	30	50	>50
B (ppm)	28	30	40	50	>50
Zn (ppm)	18	20	35	50	>50

Critical nutrient foliar concentration for Strawberries (source: Cornell University):

Element	Deficient	Below Normal	Normal	Above Normal	Excessive
N (%)	1.50	1.80	2.00	2.80	>2.80
P (%)	0.20	0.25	0.35	0.40	>0.40
K (%)	1.20	1.50	2.00	2.50	>2.50
Ca (%)	0.60	0.70	1.50	1.70	>1.70
Mg (%)	0.25	0.30	0.45	0.50	>0.50
Mn (ppm)	40	50	150	250	>250
Fe (ppm)	50	60	150	250	>250
Cu (ppm)	5	7	10	20	>20
B (ppm)	20	30	60	70	>70
Zn (ppm)	15	20	35	50	>50

Blueberry stem gall wasp

By: Janet van Zoeren and Christelle Guédot, UW- Extension, Entomology

The blueberry stem gall wasp is a secondary pest of blueberry, and on most Wisconsin farms has not been a significant problem in the past. However, over the past few years, numbers of this pest have been rising in Michigan, so it's a good idea to be aware of it this growing season, to monitor for the galls and to learn how to best manage it if the need arises.

Identification and damage symptoms: The blueberry stem gall is a kidney-shaped or spherical growth 1-2 inches in diameter formed on the stem of the blueberry plant, following the infestation by the blueberry stem gall wasp. Initially, the gall is a reddish-green color, and it turns grey-brown by fall. The wasp causing this damage is tiny, being no more than 1/10th of an inch long (see picture at right). These wasps are native to North America, and attack cultivated and wild, low- and high-bush blueberries.

Blueberry stem gall wasp. Photo by Bill Ravlin.

The gall itself forms on a stem, and decreases the vigor of the shoot and correspondingly may reduce berry yield. Left uncontrolled, these gall wasps can reach very high densities, with up to half of the stems on each

plant infested. For that reason, it is important, even if you have not had a problem with this pest in the past, to continually monitor for these galls and to control as necessary, as described below.

Gall caused by the blueberry stem gall wasp, at terminal end of a blueberry shoot. Photo by Rufus Isaacs, MSU Extension.

Life cycle and monitoring: Gall wasp eggs are laid into new shoot growth during or immediately after bloom. After about two weeks, the larvae hatch inside the tissues of the young stem, and begin to feed on the plant tissues. Damage to the blueberry stem from the egg-laying and from larval feeding causes the stem cells to respond by dividing rapidly into the bulbous kidney-shaped gall (see image at left), surrounding and isolating the developing wasp larvae, thereby protecting the larvae within the gall. The larvae continue to feed and the gall continues to grow until August, when the plant tissues harden, forming a shell that protects the wasps through the winter. In the spring, the wasps pupate, and emerge as adults before bud-break, to lay the next generation of eggs.

Because the adults are so tiny, it is best to monitor by examining blueberry plants for developing galls, which are larger and more conspicuous.

Cultural and chemical controls:

The most effective method of removing blueberry stem gall wasps, at least before they reach infestation levels, is by pruning overwintering galls off from the plant. As soon as the gall is removed from the bush, the larvae will dry up and die. It is best to prune during the winter, when larvae are overwintering in the galls, which are easier to see when leaves have fallen off the bushes.

Another way to control these wasps is to plant resistant blueberry varieties, such as Bluecrop, and to stay away from the most susceptible varieties, such as Jersey and Liberty. If you do have Jersey or Liberty bushes, those would be the best place to concentrate your monitoring efforts, and they can be used as an indicator of whether there are wasps present that could cause problems in other varieties as well.

Finally, if necessary, chemical controls should be used immediately post-bloom, as soon as the contracted bees are removed. Chemical controls will show best results if they are paired with aggressive winter pruning of galls. They also will show best results if combined with a penetrating adjuvant. A list of appropriate chemical controls is listed below. Although these insecticides do not specify blueberry stem gall wasp on the label, they are registered for blueberries in Wisconsin, and have shown efficacy against blueberry stem gall wasp in field trials Michigan.

Product Name	Mode of Action	REI	PHI
Lannate	Methomyl (1A)	48 hours	3 days
Mustang Max	Zeta-cypermethrin (3A)	12 hours	1 day
Brigade	Bifenthrin (3A)	12 hours	1 day
Danitol 2.4EC	Fenpropathrin (3A)	24 hours	3 days
Asana XL	Esfenvalerate (3A)	12 hours	14 days
Exirel	Cyantraniliprole (28**,RR**)	12 hours	3 days

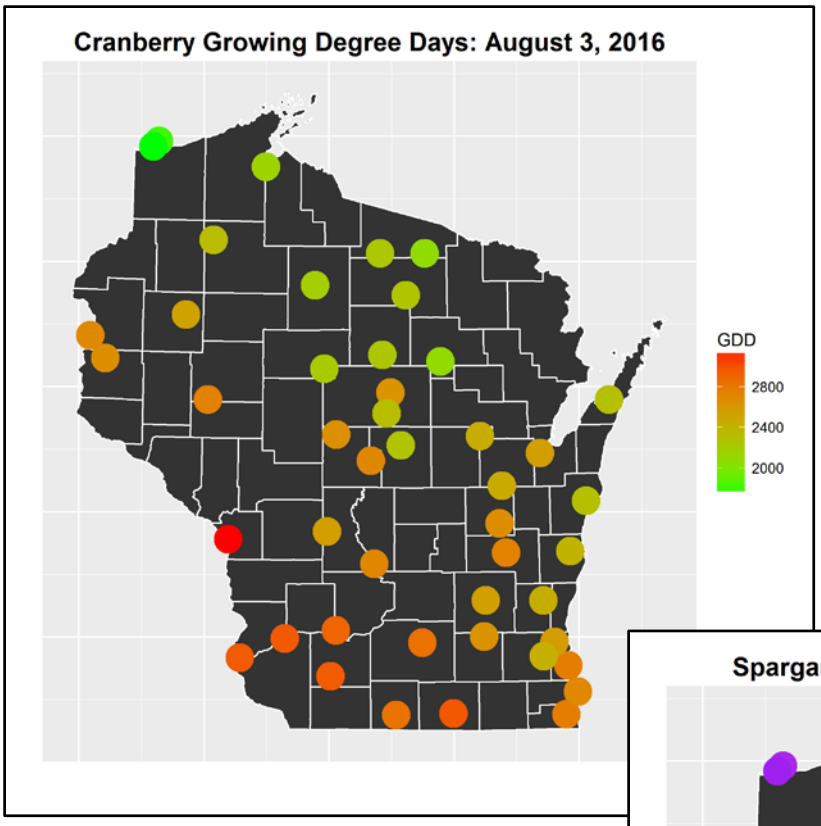
IRAC Code = Insecticide Resistance Action Committee Mode of Action group **RR** = reduced risk

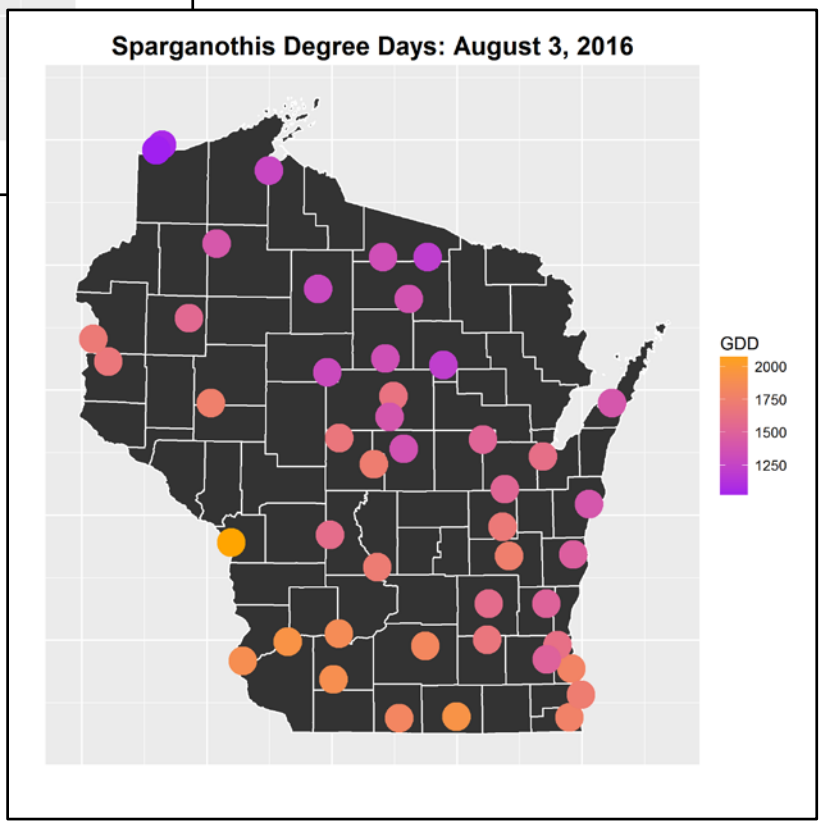
Cranberries

Cranberry Degree-Day Map and Update: as of August 3, 2016

By: Elissa Chasen and Shawn Steffan, USDA-ARS and UW Entomology

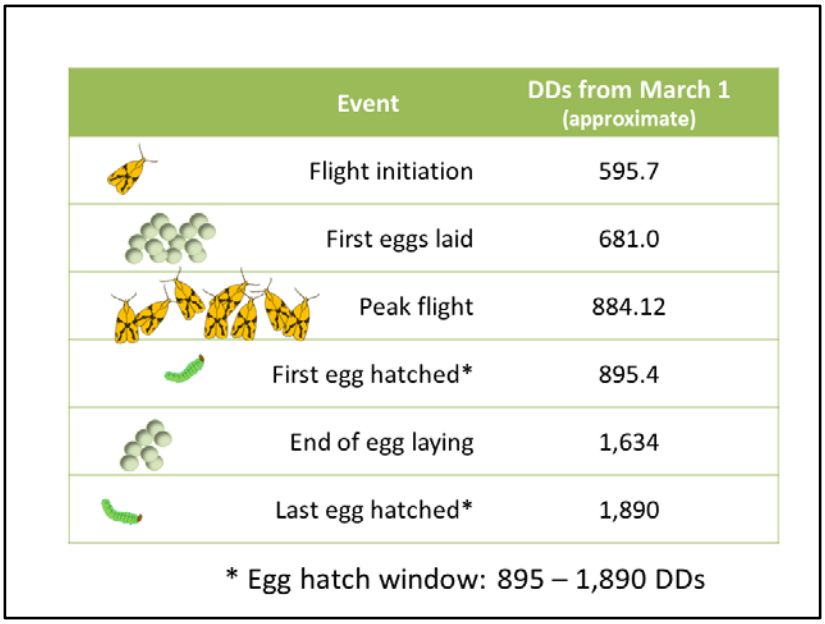
The maps below show degree-day accumulations for cranberry plants and Sparganothis fruitworm across Wisconsin up through Aug 3rd, 2016. Temperature thresholds used for these calculations are 41 and 85 °F for the plant, and 50 and 86 °F for Sparganothis.





In general, the northern region is about two weeks behind the central growing region. Plant DDs throughout WI range from 1,753-3,180. The central WI growing region has accumulated around 2,700 DD, while the northern WI growing region has accumulated around 2,200 DD.

Throughout WI, Sparganothis degree-days range from 1,010-2,099 DD. In central WI, Sparganothis DDs are around 1,700, while in northern WI, Sparganothis DDs are about 1,300. See the image below for life history benchmarks of interest for Sparganothis fruitworm and the associated degree-day estimates for each benchmark (based on Deutsch et al. 2014).



The table below allows for comparison of degree-days over the last three years.

Aug 3	Cranberry Growing Degree Days			Sparganothis Degree Days		
	2014	2015	2016	2014	2015	2016
Central WI (Wisconsin Rapids)	2,443	2,666	2,726	1,535	1,665	1,737
Northern WI (Minocqua)	2,009	2,154	2,236	1,273	1,253	1,342

Deutsch, A. E., C. R. Rodriguez-Saona, V. Kyryczenko-Roth, J. Sojka, J. E. Zalapa, and S. A. Steffan. 2014. Degree-Day Benchmarks for *Sparganothis sulfureana* Development in Cranberries. Journal of Economic Entomology 107 (6): 2130-2136.

If you would like to read more articles and find more information specific to cranberry production in Wisconsin, be sure to read the most recent Cranberry Crop Management Journal, also published by the University of Wisconsin-Extension. In the July 18th, 2016 issue of the Cranberry Crop Management Journal you will find information about: phosphorous management, the insecticide delegate, observations from an intern, early rot, early rot identification in the field, and grower updates.

Grape disease update

By: David S. Jones and Patty McManus

Temperatures in the 80s and 90s across the state in recent weeks have continued to push strong growth in our vineyards. As has been the case for the majority of the growing season, most regions have gotten regular rainfall in recent days, which has also contributed to vigorous growth as well as continued development of diseases.

PARS (Sturgeon Bay): As of July 28th we had accumulated 1203 GDD (base 50) and have recorded 4 rain events in the past two weeks. Humid and often rainy conditions have persisted throughout this region, with temperatures hanging in the 70s and 80s over the past several days. Clusters at PARS are at bunch close, and continue to grow vigorously with the heat and rainfall. Downy mildew has damaged LaCrosse, LaCrescent, Valiant, Brianna, Marechal Foch, Leon Millot, and St. Croix foliage at this time. Of these five cultivars, only the clusters of Valiant have experienced damage. Marquette, Frontenac, Frontenac gris, and Petite Pearl have not been damaged by downy mildew so far this season at this site. Black rot damage on clusters has progressed rapidly over the past few days, particularly on Marquette, Valiant, Frontenac, Frontenac gris, Petite Pearl, and LaCrosse. Both foliar and fruit damage have expanded.

We also discovered powdery mildew damage for the first time this season at PARS on July 28th. Infections were found on Brianna, Marechal Foch, and Leon Millot leaves and clusters. Infections were also noted on the clusters of LaCrosse, although the foliage does not show symptoms at this time.

WMARS (Madison): As of July 28th, we had accumulated 1573 GDD (base 50) and have recorded 4 rain events in the past two weeks. Clusters are at early verasion, and vines have continued to grow vigorously with the heat and regular rainfall over the past couple of weeks. Downy mildew is causing severe damage to the foliage of Valiant, LaCrosse, and LaCrescent at this time. St. Croix and Brianna are also showing foliar downy mildew symptoms at this time, but damage is currently much less severe on these two cultivars. As we have seen at PARS, only the clusters of Valiant are being damaged by downy mildew, so continue to focus your scouting efforts on foliage as you search for this disease. Frontenac, Frontenac gris, and Marquette have not been damaged by downy mildew at this site.

Black rot is particularly severe on Marquette and Valiant at WMARS this year. Most vines have a majority of clusters that are damaged by the disease. As previously mentioned, these cultivars are among the most severely damaged at PARS as well, so keep a particularly sharp eye out if you have these cultivars as you scout in coming weeks.

Disease Management Discussion:

What should I do if I notice that my vines have downy mildew or black rot?

For information downy mildew and black rot management, please see issue 8 of the Wisconsin Fruits Newsletter (pages 13-16).

What is the difference between powdery mildew and downy mildew?

Although the names of these diseases are very similar, these two diseases are caused by different organisms in completely different kingdoms of life. Powdery mildew is a "true fungus." The true fungi all share characteristics such as the composition of their cell walls and the number of chromosomes that they have for the majority of their life cycle that set them together as a group. Most other grape diseases such as black rot, phomopsis, anthracnose, and botrytis are all classified as "true fungi." This is part of the reason that several fungicide products are so broadly effective against these diseases.

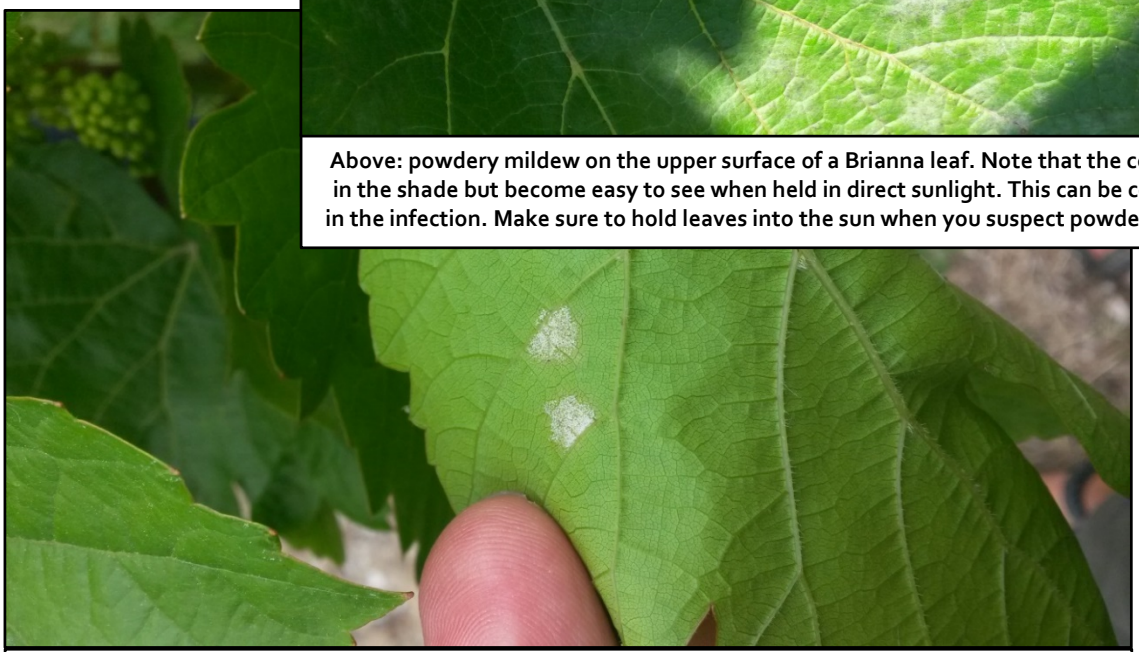
Downy mildew not actually a fungus at all. This organism falls into a group of organisms called the Oomycetes, or water molds, which is the same group that *Phytophthora infestans*, the organism that caused the Irish potato famine, is placed in. While these organisms are often lumped in with other fungi because of their similar appearance, this group of organisms has many characteristics such as cell wall composition and chromosome number through the majority of their life cycle that differs from "true" fungi, making them a distinct group.

While these distinctions may sound a bit nit-picky, understanding the difference between these two organisms and being able to identify this distinction in the field is crucial for good management because these differences mean that many products that are labeled for powdery mildew and other true fungi have poor effectiveness on downy mildew, and vise-versa. While there is some overlap in product choices for managing these two pathogens, there are also products (such as phosphorous acid for downy mildew management and potassium salts for powdery mildew) that are used ONLY for one or the other and will achieve nothing if applied to the wrong pathogen.

How do I tell the difference between powdery mildew and downy mildew in the field?

This is an extremely common question, as both the names and symptoms of these diseases can seem to be similar to one another. However, there are easy distinctions that can be made in the field with a hand lens that will help with identification.

Above: powdery mildew on the upper surface of a Brianna leaf. Note that the colonies are nearly invisible in the shade but become easy to see when held in direct sunlight. This can be common, particularly early in the infection. Make sure to hold leaves into the sun when you suspect powdery mildew may be present.



Above: downy mildew sporulation. Note that the sporulation is present on the underside of the leaf. as opposed to the picture above, showing powdery mildew sporulation on the upper side of a leaf. Downy mildew will never sporulate on the upper surface of a leaf, and powdery mildew colonies rarely look like this on the underside.

Look at the top of a leaf first as you scout. While it is not impossible for powdery mildew to colonize the underside of a leaf, powdery mildew infections typically appear on the upper surface of leaves, especially by mid-summer) and are most easily viewed in direct sunlight. You will be able to see white granules, or "powder" on each circular, white colony with a hand lens. This "powder" is actually thousands of spores, called conidia, that are produced in long chains of no more than 8 spores at a time. On fruit, powdery mildew causes a net-like black pattern in addition to necrosis as the infection spreads. The powdery spores are easily seen with a hand lens.

In contrast, downy mildew will never be found sporulating on the upper surface of a leaf. Unlike powdery mildew, which produces its spores outside of the plant on the surface of the leaf, downy mildew can only sporulate by pushing its spores out on special stalks through the natural openings in a leaf. These openings are called stomata, and are found almost entirely on the underside of leaves. As a result, downy mildew sporulation will only be present on the underside of a leaf, typically on a yellow-brown spot called an "oil spot." The spores, called sporangia, are lemon shaped and carried on tiny branched stalks rather than long chains growing directly from the surface of a leaf.

What should I do if I notice that my vines are infected with powdery mildew?

There are several products specific to powdery mildew management that can be used to address an infection. Growers are often surprised to learn that several "go-to" fungicides, such as mancozeb and captan, which are commonly used early in the season against other fungi, are not effective at controlling powdery mildew. Neither of these products is an option at this point in the season due to PHI's, but this is often a reason that powdery mildew can show up at this time of year in a block that has been well maintained for black rot and other disease earlier in the season.

Sulfur-based fungicides can be highly effective in controlling for powdery mildew. However, in our research on sensitivity of cold-climate cultivars to sulfur, Leon Millot and Marechal Foch were severely sensitive to sulfur applications. Brianna was also moderately sensitive. Please see the Northern Grape News February 18, 2016 (pages 9-11) for more information on sulfur fungicide use.

Potassium salt products can provide good control for powdery mildew when applied to existing powdery mildew infections, but they do not work as protectants. Only use potassium salts if you can see spores. Potassium salts are also not effective against other grape diseases such as black rot and downy mildew, so be certain that you are dealing with powdery mildew before making the decision to make an application with this chemistry. These salts also have less residual activity and need to be applied more frequently than sulfur or conventional synthetic fungicides.

Sterol-inhibiting (SI or DMI) fungicides can be highly effective against powdery mildew initially, but the development of resistance to sterol-inhibiting fungicides is common in powdery mildew populations. The same is true for strobulurin fungicides as well as pre-mix products with either of these two chemistries. This can become particularly common after several years of continual use in a vineyard, as powdery mildew populations can build up resistance quickly over time. For this reason, it's recommended in the Midwest Fruit Pest Management Guide that you do not use these materials alone. Instead, these products should be tank mixed with a second chemistry, such as sulfur, Quintec, Endura, potassium salts. Always make sure to check whether the cultivars that you grow are sensitive to any product used either singly or mixed to control powdery mildew.

For more information on products available with each of these chemistries and the full summaries of the information provided above, please see the Midwest Fruit Pest Management Guide, pages 91-94.

Having scouting troubles? Don't forget about our diagnostic resources!

UW-Madison Plant Disease Diagnostic Clinic: http://labs.russell.wisc.edu/pddc/
UW-Madison Insect Diagnostic Lab: http://labs.russell.wisc.edu/insectlab/
UW-Madison Soil and Forage Lab: https://uwlab.soils.wisc.edu/fees/

Grape insect scouting report

By: Christelle Guédot and Janet van Zoeren, UW- Extension, Entomology

There's nothing new to report from the past two weeks' insect scouting at the research stations. The population of Japanese beetle has decreased significantly due to the diligent management by the station personnel. All grape blocks at the West Madison Agricultural Research Station have been sprayed with insecticides five times since June, at approximately 1-2 week intervals. Applications were of either Sevin XLR Plus (active ingredient Carbaryl) or Assail 30SG (active ingredient Acetamiprid). It is important to rotate like this between different active ingredients, to reduce the risk of the beetles developing resistance to any insecticide.

Japanese beetle is still very present in the lower half of Wisconsin and is considered the number one pest of grapes by Wisconsin grape growers. While it does not seem to feed on the fruit, it can skeletonize a significant portion of the grape leaves, and can cause a corresponding reduction in yield. Please refer back to the Wisconsin Fruit News, Volume 1, issue 8 (pages 6 and 17-18) for more details on Japanese beetle management. Happy growing season!

Wine and Table Grape Developmental Stages

By: Janet van Zoeren, Becky Wiepz, Madeline Wimmer, Annie Deutsch, and Amaya Atucha – UW-Extension

Veraison has begun in southern Wisconsin at the West Madison Agricultural Research Station (WMARS). Brianna and Marquette are the furthest ahead, both at E-L developmental number 37 (berries not quite ripe). Other varieties at WMARS vary from 35 (berries begin to enlarge) to 36 (berries with intermediate sugar content). At the Peninsular Agricultural Research Station (PARS) berries are in the lag period in their development, and all are at E-L developmental number 33 (bunch closed, berries hard and green), aside from Brianna which is a little further ahead at developmental number 35 (berries begin to enlarge).

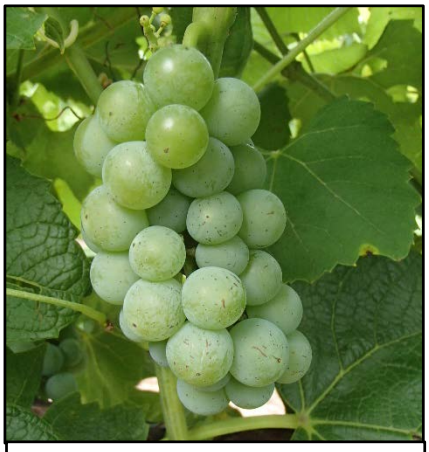
Along with photographing and recording developmental stages of these grape varieties, this week we started sampling grape berries from WMARS to measure fruit quality through sugar (Brix) and TA (titrateable acidity) concentration in berries (averages reported below). Since Brianna and Marquette cultivars are both now at veraison at WMARS, with other cultivars lagging behind, we started sampling them first. As of August 2nd, Marquette TA (g/L) was on average 22.7 and Brix was 11.0. Brianna had an average TA value of 21.5 and Brix of 9.6. In coming issues of the newsletter we will include Brix and TA information for Brianna, La Crescent, Marquette, Frontenac, Petite Pearl, and Foch cultivars, from WMARS as well as from PARS.

Target values of TA and Brix for these cold-hardy grape varieties differ among white and red cultivars. For red cultivars, fruit quality range at harvest to produce high quality wine are 20.5-23.5 Brix and 6.0-8.0 TA. For white cultivars, 19.5-23.0 Brix and 7.0-10.0 TA concentrations are recommended. However, these are general guidelines and it will depend on growers and winemakers to decide which are the fruit quality ranges desirable for the style of wine they wish to produce!

Aug 2, 2016 **Grape Brix and Titrateable Acid (TA)**

Grape Variety	Brix (%)	TA (g/L)
Brianna	9.6	21.5
Marquette	11.0	22.7

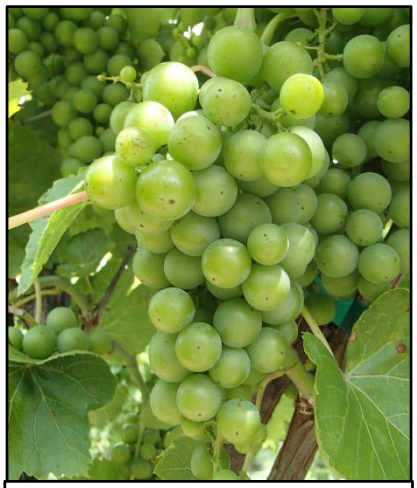
Following photos taken on August 2nd at West Madison Agricultural Research Station.



Brianna at WMARS; "berries not quite ripe" E-L number = 37

La Crescent at WMARS; "berries begin to enlarge" E-L number = 35

St. Croix at WMARS; "berries begin to enlarge" E-L number = 35



La Crosse at WMARS; "berries begin to enlarge" E-L number = 35

Frontenac at WMARS; "berries with intermediate sugar content" E-L number = 36

Marquette at WMARS; "berries not quite ripe" E-L number = 37

Somerset at WMARS; "berries not quite ripe" E-L number = 37

Einset at WMARS; "berries begin to enlarge" E-L number = 35

Following photos taken on August 3rd at the Peninsular Agricultural Research Station.

Brianna at PARS; "berries begin to enlarge" E-L number = 35

La Crescent at PARS; "bunch closed, berries hard and green" E-L number = 33

La Crosse at PARS; "bunch closed, berries hard and green" E-L number = 33

Marquette at PARS; "bunch closed, berries hard and green" E-L number = 33

Frontenac at PARS; "bunch closed, berries hard and green" E-L number = 33

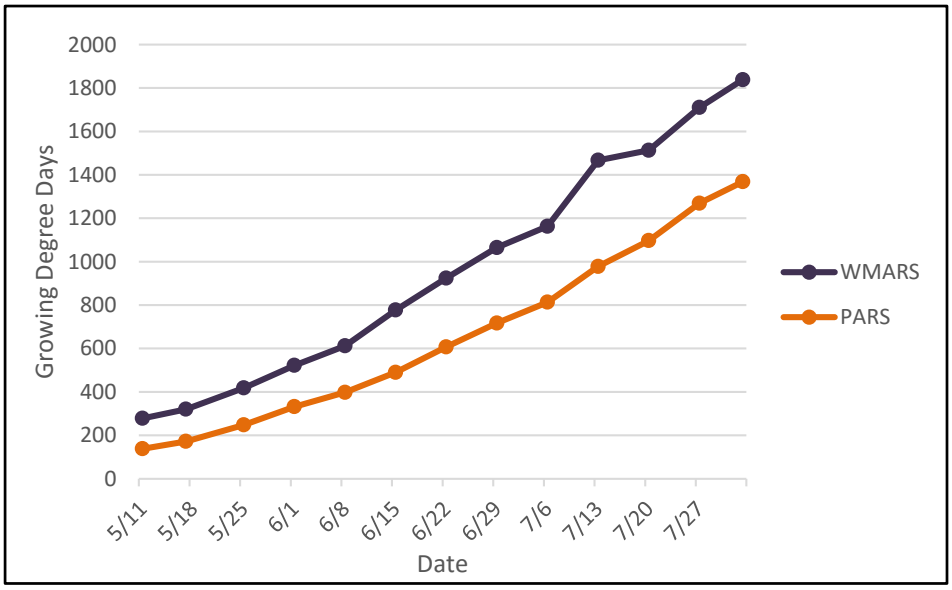
St. Croix at PARS; "bunch closed, berries hard and green" E-L number = 33

The growing degree day accumulations as of August 3rd for this year are: 1,838 GDD at WMARS and 1,368 GDD at PARS. All growing degree days are calculated using a base of 50°F.

Grape Growing Degree Days

April 1 - Aug 3, 2016

	2106	2015
WMARS	1,838	1,778
PARS	1,368	1,275



Reduced risk insecticide profile: Movento

By: Christelle Guédot, University of Wisconsin, Entomology

Insecticide: Movento

- Available as 2SC (2lb AI, Suspension Concentrate)
- Restricted re-entry interval (**REI**): 24hours
- Pre-harvest interval (**PHI**): 7 days for pome and stone fruits
- Do not exceed a total of 25 fl. oz. for pome and 15.3 fl. oz. per acre per year
- Rate of use per acre: 6 – 9 fl. oz. in pome and stone fruit
- Minimum interval between applications is 14 days for pome and stone fruits
- Do not apply until after petal fall

Movento is registered for use in Wisconsin on pome fruits including apple, crabapple, Asian pear, and quince, as well as on stone fruits including apricot, cherry (sweet and tart), nectarine, peach, plum, plumcots and prunes. It was registered around 2008, so you may have some experience with it. It is marketed by Bayer CropScience under the formulation 2SC (2 lb. of active ingredient per gallon as a Suspension Concentrate). Movento is in the class of the lipid biosynthesis inhibitors (IRAC group 23) with a mode of action that inhibits the acetyl Coenzyme A carboxylase. Movento contains the active ingredient Spirotetramat. Movento is active primarily through ingestion of treated plants against immature pest life stages. Fertility may also be reduced in adult female pests, such as aphids. Once applied to foliage, Movento is fully systemic, moving upwards and downwards through xylem and phloem to new shoot, leaf and root tissues. It is most effective against sucking insects found above and below ground.

Movento is registered for control of aphids (including wooly apple aphid), apple rust mite, mealybugs, pear psylla, pear rust mite, San Jose scale, white peach scale, and whiteflies. It also provides suppression of several pests, including codling moth, apple gall midge, two-spotted spider mite, some leafminers, and European fruit lecanium scale, among others.

Movento may be applied by ground equipment, chemigation, and by air (see label for specific application regulations). It is highly recommended to mix Movento with a spray adjuvant with spreading and penetrating properties to maximize leaf uptake and systemicity (see label for restrictions on Induce® in pome and stone fruit).

In pome fruit and stone fruit, do not apply prior to petal fall due to the need for sufficient leaf tissue to be present to allow uptake and translocation of Movento.

Movento is potentially toxic to bee larvae through residues in pollen and nectar but not to adult bees. As a precaution, avoid applying any pesticide during bloom when bees are flying.

Movento is toxic to aquatic invertebrates and oysters and must not be applied directly to water.

As always, make sure to read the label before using any pesticide. You can find the label of Movento at the following link: https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/Movento_Label1j.pdf

Antique apples with modern value

By: Janet van Zoeren and Amaya Atucha, UW- Extension

A few weeks ago we included an article on new apple cultivars available for Wisconsin growers, which have been released from private and university breeding programs in the U.S. (see Wisconsin Fruit News, Volume 1, issue 7, pages 13-16). This time we gather information on some antique and older varieties that are having a comeback due to cider production as well as demand from farmer markets consumer looking for varieties with unique flavor and aroma profiles. The varieties listed below can be found at many local or regional apple nurseries (if you would like a list of nurseries, please see Wisconsin Fruit News Volume 1, issue 7, pages 15-16).

In contrast to many of the varieties available commercially, antique varieties are found from a chance seedling or limb-sports. For this reason, they are owned publicly, to be grown by anyone anywhere. Many are of U.S. or even Wisconsin origin. Hundreds of varieties of antique apples are available—this is meant as a starting place only. They are listed in order of ripening, from early to late. It's worth noting that the later ripening varieties are unlikely to produce fruit every year in the northern-most parts of Wisconsin.

Gravenstein is one the earliest to ripen varieties. It originated in Denmark in 1669. Fruit is irregularly shaped, and has broad red stripes. Sweet-tart flavor makes it excellent for eating fresh, or for making into sauces or cider. Ripens late-July or early-August, and has a short shelf-life.

Northfield Beauty is a high-producer, and is resistant to scab. It originated in Vermont in the early 1800s. The fruit is medium-large, with red stripes on a light green background, and a tart flavor extremely well suited for pies and sauces. Ripens in late-August, and stores better than most early-season apples.

Duchess of Oldenburg is a cold-hardy, high producing tree, producing tart red apples, best used for making pies or sauces but also good for eating. A great early-season options for northern growers. Ripens in late-August; has a short shelf-life.

Summer Rambo is a tart, crisp, juicy apple that originated in France in the 1500s. The fruit is greenish-yellow with a red blush. Good for both eating and for sauces. Ripens in early-September.

Holstein has large fruit with an intense sweet/tart flavor, and is good for eating or cooking. It is a relative newcomer, being developed in Germany in the early 1900's. Shows some scab resistance. Ripens in early-September.

Court Pendu Plat is another 16th century variety, possibly of French or Roman origin. It has a dense texture, and balance of sweetness and acidity, making it excellent for cider and sauces. It is also tasty fresh. Ripens in early-September.

Wealthy makes a good eating apple with a mellow, sweet flavor and red-striped skin. Having originated in Minnesota in 1868, it is very cold-hardy, and would be a good choice for northern growers. Ripens in mid-September.

Pink Pearl is not only a novelty, with bright pink flesh underneath a smooth yellow skin, but is also a flavorful, tart, juicy and crisp apple. A suggested use is to make rosy-pink applesauce. This variety originated in California in the early 1900's and may not be a great fit for Northern orchards. Ripens in mid-September.

Wolf River originated in Central Wisconsin, and is on old-time favorite. Large apples are primarily used for baking (supposedly one apple makes one pie!). Trees are resistant to scab, cedar apple rust, mildew, and fire blight. Ripens late-September.

Reinette Gris produces medium-sized sweet, crisp and dry fruit, with a red blush. Trees are very hardy and fruit keep well. Originated in France in the 1600s. Ripens in late-September.

Egremont Russet, like other russetted varieties, has lost popularity recently to the smooth shiny apples usually showcased in the grocery stores. However, despite its rough, uniform appearance, egremont russet is full of unique flavor and a pear-like smooth texture. Originating in England in the 1800s, it is cold hardy and scab resistant. The flavor has been described as nutty, smoky, or with anise undertones, which combined with the smooth texture makes for a one-of-a-kind apple. Ripens in late-September to early-October.

Newtown Pippin has a distinctive flavor, and firm, crisp flesh. The skin is light yellow-green with just a slight red blush. Developed on Long Island in the 1700s. Excellent for eating fresh or for making cider. Ripens in late-October.

Northwestern Greening originated in Wisconsin in the late 1800s. It is the predominant apple-pie apple of the north, but is too tart for eating fresh. Ripens in October.

Arkansas Black is a deeply colored, crisp, and flavorful apple. Cold hardy to zone 4. For best flavor, store at least a month before eating, and can be stored up to eight months in refrigeration. Ripens in October.

Winesap is an old-timer favorite, with high sugar content, a crisp texture, and a deep red color. Originated in the US in the 1800s. High producer and stores well. Ripens in late-October.

Black Oxford produces a dark purple, almost black skinned fruit with tart, aromatic flesh. Originated in Oxford, Maine in the 1800s. Fruit keeps well in storage. Ripens in November.

Update on brown marmorated stink bug

By: Christelle Guédot and John Joutras, UW-Madison, Department of Entomology

The state monitoring project for brown marmorated stink bug (BMSB; *Halyomorpha halys*) is well underway with a total of 51 traps that have been maintained since June: 47 traps in Wisconsin, three traps in Minnesota at the border with Wisconsin, and one trap in northern Illinois. Traps are located in wooded areas (where BMSB would overwinter in nature), in urban areas (where BMSB tends to aggregate looking to overwinter in houses), in apple orchards, and in vegetable or field crops. So far we have not caught BMSB in these traps, despite the increase in sightings in urban areas -- primarily Madison. Even the trap at my house in Monona has not caught a single BMSB, even though I see (and destroy!) BMSB nymphs on a regular basis on my cotoneaster bushes.

In mid-July, the invasive species was spotted at the public Allen Centennial Garden on the UW-Madison campus by the insect diagnostic lab's PJ Liesch, with at least a dozen nymphs and adults feeding on this plant undisturbed. John Joutras, in charge of the monitoring project, placed a trap near the infested dogwood shrub where BMSB nymphs and adults had been observed feeding. John is

A third-instar nymph and adult BMSB female. Note the distinctive white banding on the antennae of both nymph and adult. Photo by John Joutras.

servicing this trap weekly and reported catching three nymphs on July 27, and four nymphs on August 3. So the trapping season has begun in urban areas!

Currently, BMSB is not an agriculturally important pest in Wisconsin, but could be in the near future. The species was first detected in southeast Wisconsin in 2010, and has been confirmed in 11 counties since.

The northeastern U.S. has seen the worst of the BMSB's impact, with one statistic citing an estimated $37 million in damages to apple crops by BMSB in the mid-Atlantic region in 2010. While BMSB shows a preference for fruiting trees, the insect is polyphagous and will feed on a variety of commercially grown fruits, vegetables, field crops, as well as ornamental hosts.

If you suspect you found a BMSB, take a picture with a coin in the frame for size reference (see example on previous page), or collect a specimen and let John know at jjoutras@wisc.edu.

This BMSB nymph was captured feeding on the fruit of an ornamental dogwood shrub. Photo by John Joutras.

Calendar of Events

August 10, 2016 – Cranberry Growers Summer Field Day
Brockway Cranberry, Black River Falls, WI

August 15, 2016 – Urban Horticulture Day
10 am – 2 pm; West Madison Agricultural Research Station, Verona, WI

August 31, 2016 -- WBGA Fall Field Day
Carandale Farm, 5683 Lincoln Rd, Oregon, WI

September 7, 2016 – WMARS Vineyard Walk
West Madison Agricultural Research Station, 8502 Mineral Point Road, Verona, WI

September 23-25, 2016 – Warrens Cranberry Festival
Warrens, WI

Useful Links:

You can purchase ($10) the 2016 Midwest Fruit Pest Management Guide from the UW Learning Store:
http://learningstore.uwex.edu/Midwest-Fruit-Pest-Management-Guide-2016-P1785.aspx

Wisconsin Fruit Website: https://fruit.wisc.edu/

Insect Diagnostics Lab: http://labs.russell.wisc.edu/insectlab/

Plant Disease Clinic: http://labs.russell.wisc.edu/pddc/

Soil and Forage Analysis Lab: https://uwlab.soils.wisc.edu/

Weed Identification Tool: http://weedid.wisc.edu/weedid.php

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