Wisconsin Fruit News

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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 April 30, 2016 through May 20, 2016.

PLANT/SAMPLE TYPE	DISEASE/ DISORDER	PATHOGEN	COUNTY
FRUIT CROPS			
Juniper	*"Cedar-Apple" Rust*	*Gymnosporangium sp.*	*Milwaukee*
Apple	*Dormant Oil Leaf Burn*	*None*	*Grant*

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

Keeping special pesticide registrations in mind when planning fruit pest management

By: Jed Colquhoun, Professor and Extension Specialist, UW-Madison Department of Horticulture

New and localized pest problems can be extremely challenging in fruit production. In response, researchers, pesticide registrants and the Wisconsin DATCP often work together to get time-limited special pesticide registrations or permits to address these situations. These rather dire pest situations, however, are a subject of many grower questions during this time of year. What special labels are available in Wisconsin and for which crops? Did the special label that I used last year expire or can I still use the pesticide?

The Wisconsin DATCP has combined all of the relevant information to answer these and other questions into a useful table that is accessible online at: http://datcp.wi.gov/Plants/Pesticides/Special_Registrations/. From this web page, simply click on "Wisconsin Special Registration Pesticide Listing". The table includes the pesticide name, specific pest situations and crop sites that are addressed by the special label and the valid dates for use, among other information. Additionally, clicking on the product name will open a copy of the Wisconsin label.

There are two types of special pesticide labels often found on this page: Special Local Need Registrations (Section 24c) and Emergency Exemptions (Section 18). The section numbers refer to parts of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) that dictate how the federal Environmental Protection Agency (EPA) regulates pesticide use. These sections recognize that localized outbreaks and emergency situations require a rapid pesticide registration process to address the need. The type depends on the pest situation:

- Special Local Need (24c) registrations are issued by the state and reviewed by EPA for a demonstrated special local pest management need. In most cases a pesticide tolerance in the harvested product or exemption from a tolerance has been established. These registrations are often valid for longer than Emergency Exemptions.
- Emergency Exemptions (Section 18) are requested from EPA by DATCP to permit an unregistered use of a pesticide and typically are valid for only up to one year. The Emergency Exemptions address urgent, non-routine pest problems that jeopardize agricultural production and aren't managed by current options.

These tools can be very valuable components of an integrated pest management program in fruit crops where pest outbreaks are often unpredictable. Even more so than typical pesticide labels, special labels change often and are time-limited! As always, read and follow the label prior to use!

Raspberry varieties and their infestation by *Drosophila suzukii*

By: Alina Avanesyan and Christelle Guédot

One of the major insect pests which attack raspberry plants during their fruiting time is the invasive fly species, the spotted wing drosophila (SWD), *Drosophila suzukii*. The female fly attacks undamaged (unlike other *Drosophila* species) ripening fruit; it lays eggs under the skin of the fruit, and emerging maggots feed inside the fruit making them unmarketable.

Some of the raspberry varieties, however, can minimize or even avoid the infestation by SWD. How and which raspberry varieties can potentially limit the risk of being attacked by the SWD? From a plant perspective, the key to success would be to fruit when pests are not yet present, a strategy known as ***phenological resistance***. Here we talk about the main raspberry varieties and discuss the examples from recent studies on how development of raspberry plants may or may not match the seasonal occurrence of the spotted wing drosophila.

Raspberry plants can live many years, but only the root system and the crown are actually ***perennial***. The individual shoots (***canes***), however, are ***biennial*** which means that they may live only two years. With regards to fruiting such canes can differ in different raspberry varieties; as a result, we can see raspberry plants fruiting either early in summer (***summer-bearing raspberries***), or in fall (***fall-bearing raspberries***).

In the summer-bearing raspberries, the canes of the first year (called ***primocanes***) show up early in spring and have only vegetative growth during the first year. On the second year, primocanes (now called ***floricanes***) have flowers and then fruit early in the summer season. In the fall-bearing raspberries, however, primocanes have fruit during the first fall season. On the second year, primocanes continue to have fruit usually until mid-summer, and then they die (Fig. 1 and Table 1).

Table 1. Raspberry varieties: 'life' of one cane (*based on Barney et al., 2007; Heflebower et al., 2013*).

Year	Floricane-bearing (summer) raspberries						Primocane-bearing (fall) raspberries					
Months	Spring	Jun.	Jul	Aug	Sept.	Oct	Spring	Jun.	Jul.	Aug	Sept.	Oct
1st year	A primocane emerges	Vegetative growth					A primocane emerges	Vegetative growth	Flowers	Fruit		
2nd year	The primocane is now a floricane	Flower	Fruit		The primocane dies		Flowers (the primocane of the 1st year)	Fruit (the primocane of the 1st year)			The primocane dies	

In terms of crop yield the fall-bearing raspberries have some advantages over the summer-bearing raspberries, by adding six weeks or more to the fruit season (Pritts, 2008). However, those additional weeks of fruiting might coincide with high infestation of raspberry plants by SWD. For example, it was observed that in Wisconsin the first flies can be detected as early as mid-June; the fly population builds up from late June/early July with the population peak in late August/early September; and then populations gradually decrease during the Fall (Table 2).

Table 2. Phenology of SWD in Wisconsin; raspberry plots, 2013-2014 (*based on Pelton et al., 2016*).

Year	June		July	August		September	October
2013		First detection	Population increase			Population peak	Population decrease
2014		First detection	Population increase		Population peak	Population decrease	

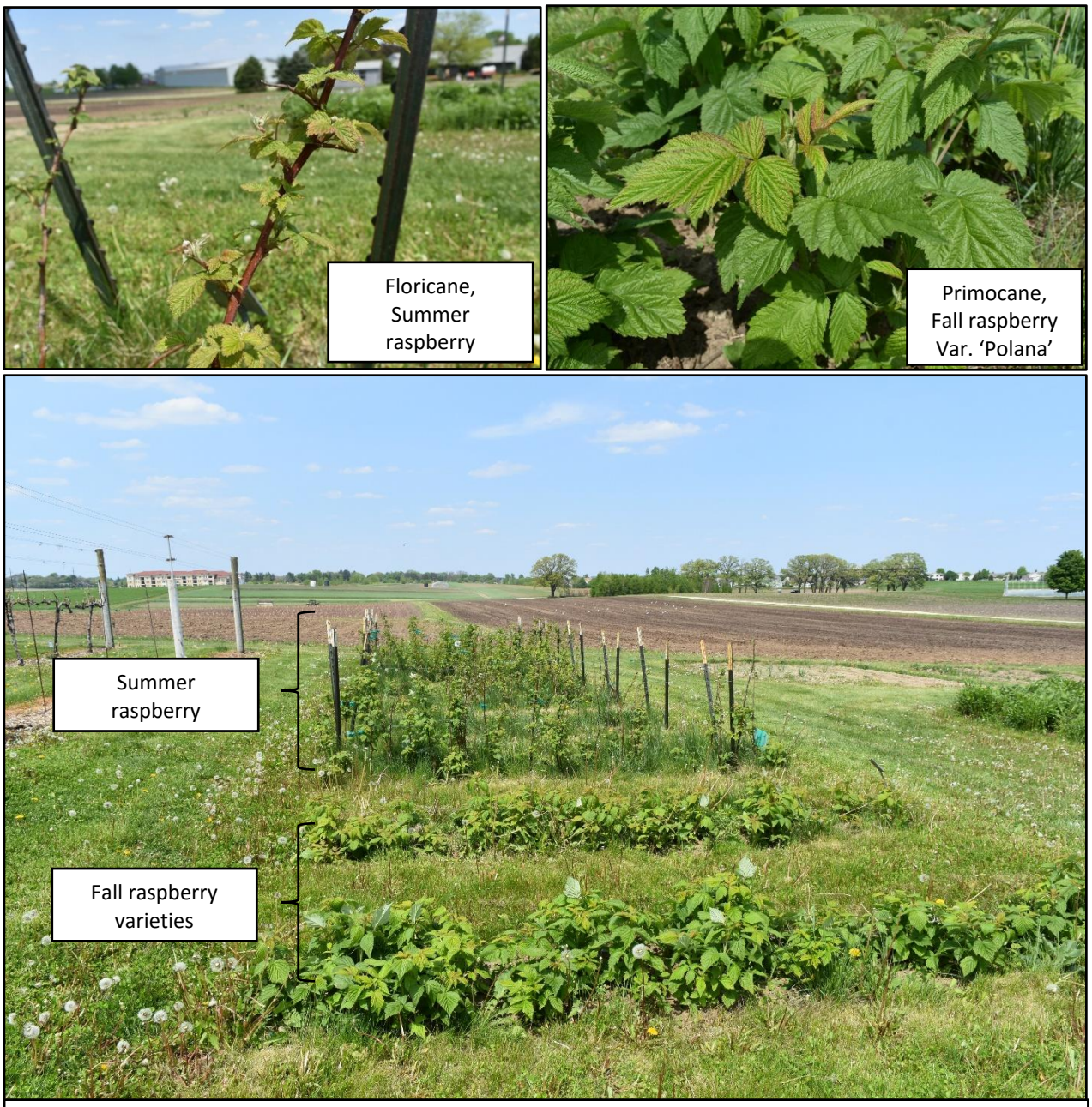


Fig.1. Summer and fall raspberry varieties at West Madison Agricultural Research Station on May 19, 2016.

Even though all raspberries might be susceptible to SWD, different varieties of summer raspberries and fall raspberries still can have different infestation rate. For example, Burrack et al. (2013) compared the SWD larvae infestation rates in the field across different commonly grown raspberry varieties in the southeastern US. They found that although none of the varieties escaped infestation, some varieties such as floricane-bearing 'var. NC 344' and primocane-bearing 'Nantahala' had lower infestation rates (Table 3). At the same time, some summer (floricane-bearing) raspberry varieties might not differ in the SWD infestation (Lee et al., 2011; Table 3).

Although some raspberry varieties can be more preferable for the SWD than others the overall tendency is that summer-bearing raspberries have limited risk for SWD and fall-bearing raspberries are more vulnerable with potentially heavy infestation in August-September. Phenological resistance of raspberry to SWD is still being explored, and here is the example of what we might observe when the plant harvest does or doesn't coincide with establishing of SWD population (Fig.2; *blueberry plants*). Another good example of phenological resistance is strawberry plants which avoid SWD infestation due to early fruiting.

Table 3. The SWD infestation rate in some floricane-bearing (summer) and primocane-bearing (fall) raspberry varieties.

Raspberry varieties	Type of fruit bearing	Infestation rate (mean number of developing adults from fruit infested with larvae)	Author
Autumn Britten	Primocane	Highest infestation	Burrack et al., 2013 *(fruit collected from field)*
Caroline	Primocane	Medium infestation	
Himbo Top	Primocane		
Joan J	Primocane		
NCTG-1	Floricane		
Nova	Primocane		
Octavia	Floricane		
Nantahala	Primocane	Low infestation	
NC 344	Floricane	Lowest infestation	
Cascade Delight	Floricane	No differences in infestation rate between these varieties	Lee et al., 2011 *(fruit infested in lab)*
Centennial	Floricane		
Coho	Floricane		
Encore	Floricane		
Malahat	Floricane		
Willamette	Floricane		

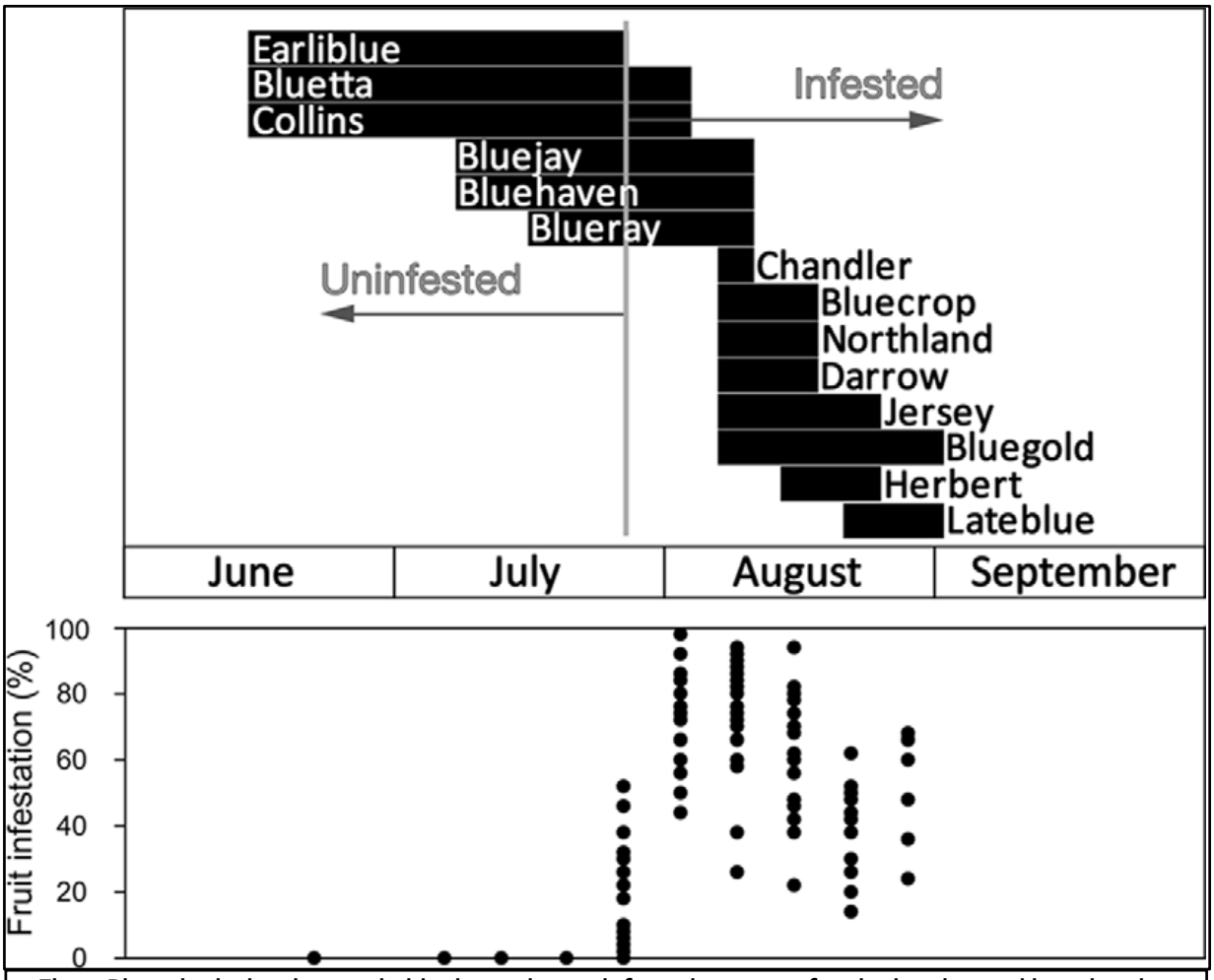


Fig.2. Phenological resistance in blueberry: larvae infestation rates of early ripening and late ripening cultivars (from Hampton et al., 2014)

There are several potential factors which can affect the accessibility of raspberry varieties for SWD and which might explain why some varieties are infested more than others. Such factors can include penetration force (most likely the key factor), yield and fruit size (Burrack et al., 2013). It was observed that the flies prefer berries which are easier to penetrate and which are smaller; while no differences in fly infestation among lower-yielding and higher-yielding varieties have been detected (Burrack et al., 2013).

Considering all those differences in raspberry plants which we discussed above, **we recommend planting early-fruiting (summer-bearing) varieties. This would provide additional protection to the plants from SWD infestation through the mechanisms of phenological resistance.** As a result, such early-fruiting varieties might minimize risk from SWD or even completely avoid fruit infestation by SWD.

References:

Barney, D. L. et. al (2007). *Commercial red raspberry production in the Pacific Northwest*. [Corvallis, Or.]: Oregon State University Extension Service;[Moscow, Idaho]: University of Idaho Cooperative Extension System;[Pullman, Wash.]: Washington State University Extension;[Washington, DC]: US Dept. of Agriculture.

Burrack, H. J., Fernandez, G. E., Spivey, T., & Kraus, D. A. (2013). Variation in selection and utilization of host crops in the field and laboratory by *Drosophila suzukii* Matsumara (Diptera: Drosophilidae), an invasive frugivore. *Pest management science*, *69*(10), 1173-1180.

Hampton, E., Koski, C., Barsoian, O., Faubert, H., Cowles, R. S., & Alm, S. R. (2014). Use of early ripening cultivars to avoid infestation and mass trapping to manage Drosophila suzukii (Diptera: Drosophilidae) in Vaccinium corymbosum (Ericales: Ericaceae). *Journal of economic entomology*, *107*(5), 1849-1857.

Heflebower, R., Hunter, B., Olsen, S., & Black, B. (2013). A Comparison of 10 Fall Bearing Raspberry Cultivars for Northern Utah.

Lee, J. C., Bruck, D. J., Curry, H., Edwards, D., Haviland, D. R., Van Steenwyk, R. A., & Yorgey, B. M. (2011). The susceptibility of small fruits and cherries to the spotted-wing drosophila, *Drosophila suzukii*. *Pest management science*, *67*(11), 1358-1367.

Pelton, E., Gratton, C., Isaacs, R., Van Timmeren, S., Blanton, A., & Guédot, C. (2016). Earlier activity of *Drosophila suzukii* in high woodland landscapes but relative abundance is unaffected. *Journal of Pest Science*, 1-9.

Pritts, M. (2008). Primocane-fruiting raspberry production. *HortScience*,*43*(6), 1640-1641.

Event notification: Monroe and Richland counties will be hosting a small fruits field day on June 14th.

The event will begin in the morning at at Field of Dreams Blueberries located at 23897 Destiny Avenue, in Tomah, then will move for the afternoon to Lazy Patch Farm, 33351 State Rd 154 in High Point. The agenda at each location will be the same, with talks covering:

- Soil Fertility Management- Pre and Post Planting (Dr. Amaya Atucha- UW Extension Fruit Crop Specialist)
- Taking Care of Pollinators and SWD Update (Dr. Christelle Guedot- UW Extension Fruit Crop Entomologist)
- Disease Management Update in Small Fruits (Dr. Patricia McManus- UW Extension Fruit Crop Pathologist)

Please see the event notification following, or visit the event section of our webpage for more information.

UW Extension
University of Wisconsin-Extension

News Release

May 20, 2016

Contact: Bill Halfman, UW Extension Agriculture Agent
Phone: 608-269-8722

UW Extension to Host Small Fruit Growers Workshops June 14 near Tomah and Hill Point

UW Extension Fruit Specialists and UW Extension in Monroe and Richland Counties will be holding small fruit management workshops for commercial fruit growers of all sizes at two locations on June 14th. Commercial Fruit Growers are folks who are growing small fruits to generate revenue from their sale.

Topics and presenters for the workshops are as follows:

- Soil Fertility Management- Pre and Post Planting
  - Dr. Amaya Atucha- UW Extension Fruit Crop Specialist
- Taking Care of Pollinators and SWD Update
  - Dr. Christelle Guedot- UW Extension Fruit Crop Entomologist
- Disease Management Update in Small Fruits
  - Dr. Patricia McManus- UW Extension Fruit Crop Pathologist

Presenters will be happy to answer participant questions about other common fruit crops that may not be grown at the host locations.

At each workshop the owners will provide an overview of their operation.

Please bring along your folding lawn chairs to each location for seating during the presentations and discussions.

The Tomah area workshop will begin with registration at 9:30 am with the program going from 10 am to about noon. It will be held at Field of Dreams Blueberries located at 23897 Destiny Avenue, Tomah 54660. Field of Dreams has approximately 5 acres of blueberries and markets their berries via pick your own, and through some area retailers. Please contact the Monroe County Extension Office 608-269-8722 by June 10th in order to have adequate handouts for everyone.

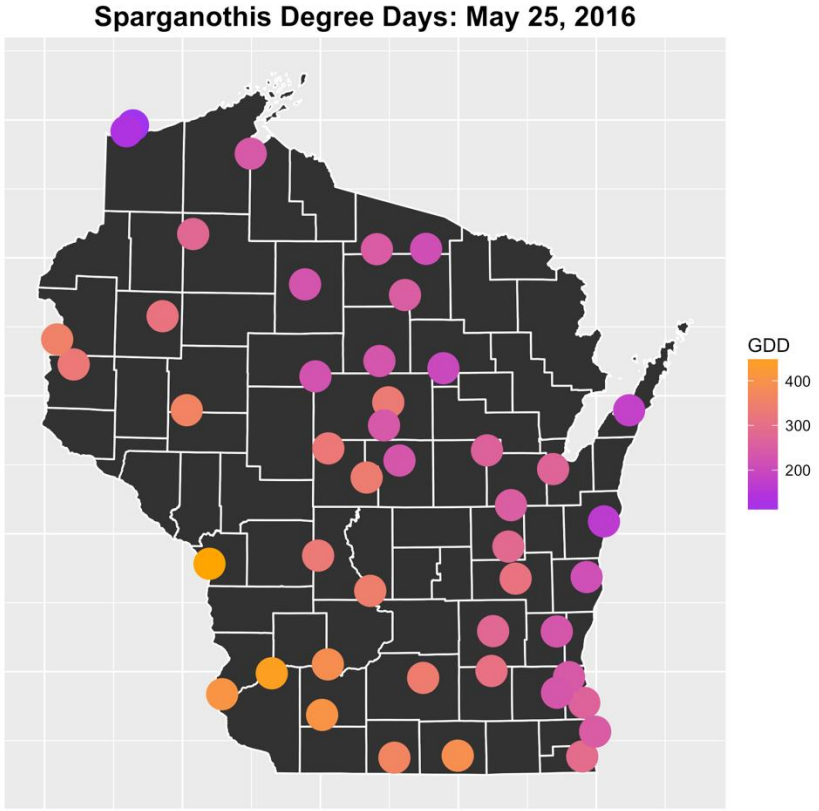
The Hill Top area workshop will begin with registration at 1:30 pm with the program going from 2 pm to about 4 pm and will be held at Lazy Patch Farm, 33351 State Rd 154, Hill Point, WI 53937. Lazy Patch is a 2 acre fruit farm that focuses on berry production including raspberries, strawberries, Juneberries and blueberries. They also have small orchard that includes grapes and multiple types of fruit trees. Lazy patch wholesales the fruits they produce to local grocery stores. Please contact the Richland County Extension Office 608-647-6148 by June 10th in order to have adequate handouts for everyone.

Upcoming Degree-Day Benchmarks for Sparganothis and Degree-Day Maps: May 25, 2016

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

In these warmer days of spring and summer, degree-days can accumulate pretty quickly. For example, each of the last few days with lows in the 50s and highs near 80 degrees accrued somewhere around 20 degree-days. You can see this easily in the degree-day look up table that the Steffan lab created for Sparganothis fruitworm (http://labs.russell.wisc.edu/steffan/files/2013/11/Degree-day-look-up-table.pdf).

The map below shows that Sparganothis degree-days are ranging across the state from a low of 105 DD to a high of 460 DD. In central WI cranberry growing regions, we have accumulated around 350 degree-days, and flight is predicted to begin around 600 degree-days which means it is likely that flight will begin before the next degree-day update! Northern WI growers will have a bit longer to wait before it reaches this benchmark.

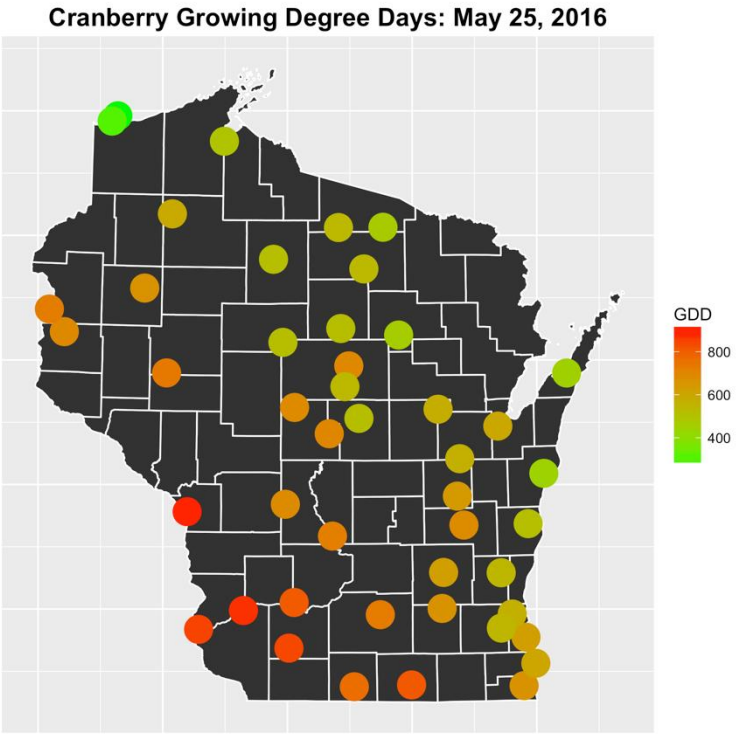


With that in mind, the figure below illustrates key Sparganothis benchmarks and their associated degree-day estimates. In general, insecticide applications aimed at adults can be timed for peak flight, while insecticide applications aimed at larvae are often timed for the middle of the egg-hatch window (i.e., larval emergence), depending on the insecticide being used. Compounds with long residual activity for eggs/larvae can be applied earlier in the egg-hatch period, while compounds with shorter activity generally may need to be applied near or a little after peak emergence (for Sparg, this is ~1,400 DDs).

Event	DDs from March 1 (approximate)
Flight initiation	595.7
First eggs laid	681.0
Peak flight	884.12
First egg hatched*	895.4
End of egg laying	1,634
Last egg hatched*	1,890

* Egg hatch window: 895 – 1,890 DDs

The map below shows degree day accumulations for the cranberry plants through May 25, 2016. Throughout WI, plant degree-days ranged from a low accumulation of 255 DD to a high of 910.



The table below allows for comparison of degree-days over the last three years. Based on our observational data from the last couple of years, plants at this time will be likely in cabbage head and moving into roughneck.

May 25	Cranberry Growing Degree Days			Sparganothis Degree Days		
	2014	2015	2016	2014	2015	2016
Central WI (Wisconsin Rapids)	517	789	705	233	405	343
Northern WI (Minocqua)	394	563	544	172	260	251

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 May 9, 2016 issue of the Cranberry Crop Management Journal you will find information about: Degree Day modeling, cottonball, Indar, spring nitrogen fertilizer applications, generic versions of Callisto, Confirm, spring thoughts, cranberry juice for heart health, and grower updates.

Grape Disease Update and Grape Disease Scouting

By: David S. Jones and Patty McManus

Grape scouting at the Peninsular Agricultural Research Station began on May 18th shortly after bud burst. The West Madison Agricultural Research Station was scouted for the 4th time on May 22nd, where shoots are currently about a foot long. The warm, dry weather throughout much of southern Wisconsin and Door County caused a strong flush of growth at over the past week, but has not been favorable for disease due to the absence of free water for spore germination. No powdery mildew, downy mildew, Phomopsis, or black rot symptoms have been detected yet at either site. However, with lots of rain in the forecast for most of Wisconsin in the next several days and daily highs projected to consistently warm past 60 degrees, this will likely change. Your weekly scouting program should be in place at this time. Keep a particular eye on the developing grape blossoms this week, as a preventative spray against black rot and downy mildew will need to be made just before grape blossoms open.

This is a great time to refresh on some of the basics of grape scouting, as disease symptoms may begin to appear in the next few weeks. This week we will be talking about several important steps to effectively scouting your vineyard. Here are some of the strategies that we use to make sure that we stay on top of diseases as they develop and make accurate diagnoses:

1.) Invest in a hand-lens or headband magnifier (e.g. Optivisor). Hand lenses and headband magnifiers are critical tools for good scouting, particularly when we are looking for fungi and fungus-like organisms. This is because they allow us to see spores or fungal fruiting bodies that are often difficult to see with the naked eye, lessening the risk of making an incorrect diagnosis and taking the wrong action in your vineyard. For example, black rot leaf lesions are cream to tan colored with a reddish to reddish brown exterior. In addition, they are always sprinkled with small black pimples, called pycnidia. Herbicide damage, mechanical damage, micronutrient deficiency, and a wide variety of other agents can all cause cream or brown colored lesions. These spots are sometimes colonized by opportunistic fungi, so there may be a few fruiting bodies, but they lack the numerous black pycnidia we see with black rot. A check with a hand lens will easily tell the difference, and could save a spray. The same principle applies to powdery mildew and downy mildew, which each make distinctive spore structures that that are invisible to the naked eye.

Above: the tiny black dots in this image are chasmothecia (fruiting bodies) of powdery mildew on the abaxial (bottom) side of a Frontenac leaf observed late in the season. They are invisible to the naked eye, but can be seen easily with a hand lens. Photo by D.S. Jones.

2.) Check both sides of multiple leaves on each plant, selecting both old and new leaves and holding each side in direct sunlight as you scout. This is particularly critical in identifying powdery mildew and downy mildew. Powdery mildew tends to colonize the adaxial (upper) side of a leaf, while downy mildew tends to sporulate from the abaxial (bottom) side of the leaf. Furthermore, early season powdery mildew colonies are often only visible in direct sunlight. Focus your early-season scouting efforts on plant parts near where pathogens overwinter. For example, downy mildew symptoms are often first seen on lower leaves or

suckers because the downy mildew pathogen overwinters on the ground, whereas black rot symptoms are usually first seen in close proximity to mummified fruit either left on spurs or on the ground.

Early powdery mildew infection is often only visible in direct sunlight. Notice that the shady portion of this leaf looks green and healthy, but placement of the leaf in direct sunlight immediately reveals powdery mildew colonies on the leaf surface. Photo by D.S. Jones.

3.) Don't forget to scout your fruit. Diseases such as black rot on clusters tend to easily catch your eye as you scout, but don't forget that diseases like powdery mildew are harder to see, and can infect both fruit and rachis tissue. Powdery mildew infection on developing rachis and fruit tissue can result in uneven sizing and problems with ripening. In extreme cases, fruit can even crack open due to poor expansion of the fruit epidermis. Always inspect several clusters on each plant you scout, paying attention to both berries and rachis tissue.

4.) Don't forget about insect damage, micronutrient deficiency, and mechanical damage as you scout for fungi. Remember, not all spots, patterns, or lesions are caused by fungi or fungus-like organisms. Keep an open mind when scouting, use your hand lens, and remember what the specific symptoms of economic diseases are. When in doubt, contact a UW diagnostics specialist, information provided below.

5.) Practice regular scouting. Scout at least once per week, covering plants throughout the entire vineyard. Diseases like downy mildew and powdery mildew can go from several isolated infections to an outbreak in a matter of only a few days in a conducive environment, so it is critical that vineyards are checked routinely. Be sure to carry flagging tape to mark vines with questionable symptoms so that you can readily find them later to follow up on development or to collect samples for lab analysis. Remember, the effectiveness of a scouting program is limited if it is not implemented with the appropriate frequency.

Rachis tissue of Frontenac gris cluster infected by powdery mildew on an otherwise healthy plant. Healthy looking leaves are not always a guarantee of healthy fruit. Photo by D.S. Jones.

Additional Resources: A good scouting program will help keep you informed as you identify problems each year, but it is also no guarantee that you will be able to identify everything you find. If in doubt, don't forget about the UW-Diagnostic Clinic, the UW-Insect Diagnostics Lab, and the UW-Soil and Forage Lab. If at any point during the season you experience a problem that you are not familiar with, send a sample to the appropriate lab here at the UW for identification. Correct diagnosis means the correct response, saving you time and money in the future.

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/

Wine and Table Grape Developmental Stages

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

As mentioned in the "supplemental" issue of the Wisconsin Fruit News, published on May 17th, there was some damage from frost at West Madison Agricultural Research Station since the last developmental stage photos were taken. We were out on May 17th to see how different grape varieties had fared: Brianna grapes seemed to be hit especially hard (do you have a percentage of damage? I don't think that any variety presented damage over 10%), possibly due to their developmental stage at the time, location, or some other factor. St. Croix showed the least damage, with only a few vines affected and the damage seen being less severe.

The following photos were taken on May 17th at West Madison Agricultural Research Station.

Brianna at WMARS; "3 leaves separated from shoot" E-L number = 9; note severe frost damage

St. Croix at WMARS; "6 leaves separated, inflorescence clear" E-L number = 13; Some frost damage but less severe

Subsequently, we were out at WMARS again on May 24th to see how the vines have been recovering from the frost. Aside from the vines located in low spots in the vineyard, which had more damage than the vines located in higher spots, there wasn't much damage.

Healthy shoots are expanding rapidly as a consequence of the warmer temperature we have experienced in the last 2 weeks, and the inflorescences are beginning to be visible. Brianna variety appears to be slightly behind the other varieties we looked at: Brianna vines are at E-L* developmental number 12 (5 leaves separated, inflorescences clear), while the other cultivars are at E-L developmental number 13 (6 leaves separated, inflorescences clear).

* *Eichhorn-Lorenz Phenological stages to describe grapevine development*

The following photos were taken on May 24th at West Madison Agricultural Research Station.

Brianna at WMARS; "3 leaves separated from shoot" E-L number = 9; may produce fruit despite frost damage

La Crescent at WMARS; "6 leaves separated, inflorescence clear" E-L number = 13; unlikely to recover from severe frost damage

Frontenac at WMARS; "6 leaves separated, inflorescence clear" E-L number = 13

Frontenac inforescence at WMARS

Marquette at WMARS; "6 leaves separated, inflorescence clear" E-L number = 13

Marquette inflorescence at WMARS

St. Croix at WMARS; "6 leaves separated, inflorescence clear" E-L number = 13

La Crescent at WMARS; "6 leaves separated, inflorescence clear" E-L number = 13

La Crosse at WMARS; "6 leaves separated, inflorescence clear" E-L number = 13

Brianna inflorescence at WMARS; "5 leaves separated" E-L number = 12

Somerset at WMARS; "6 leaves separated, inflorescence clear" E-L number = 13

Einset at WMARS; "7 leaves separated, inflorescence clear" E-L number = 14

The buds at the Peninsular Research Station are still much further behind. Most cultivars are at E-L developmental number 9 (2-3 leaves separated, shoots 2-4 cm. long). Similar to at WMARS, the Brianna vines at PARS are a little bit behind the other cultivars; Brianna vines are al E-L developmental number 4 or 7 (budburst to first leaf separated from shoot tip). Some flea beetle damage was seen, and we were even able to get the following picture of the perpetrator itself.

The following photos were taken on May 25th at the Peninsular Agricultural Research Station.

Flea beetle at PARS

Marquette at PARS; "2-3 leaves separated" E-L number = 9

Frontenac at PARS; "2-3 leaves separated" E-L number = 9

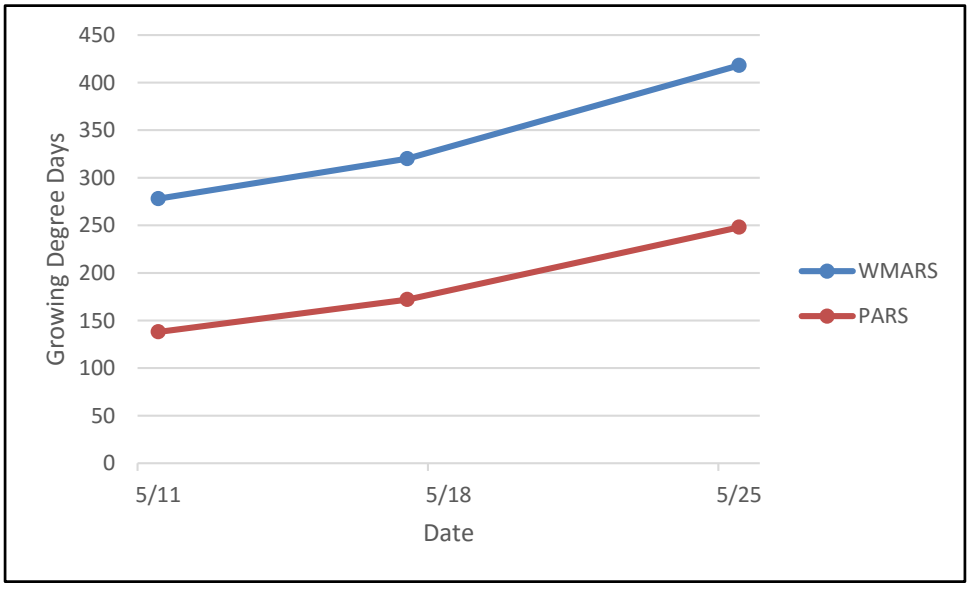
St. Croix at PARS; "2-3 leaves separated" E-L number = 9

La Crosse at PARS; "2-3 leaves separated" E-L number = 9

Brianna at PARS; "budburst" E-L number = 4

The growing degree day accumulations as of May 25th are: 418 GDD at WMARS, 248 at PARS. Degree days are calculated using a base of 50°F.

April 1 - May 25 2016	Grape Growing Degree Days
WMARS	418
PARS	248



Insecticide: Altacor

- Available as 35WG (35% AI, Water Granule)
- Restricted re-entry interval (**REI**): 4hours
- Pre-harvest interval (**PHI**) on most pome fruits: 5 days and on stone fruits: 10 days
- No more than 4 applications for pome fruits and 3 for stone fruits per season
- Do not exceed a total of 9 oz. per acre per season
- Rate of use per acre: 2.5 – 4.5 oz. based on pest and crop
- Minimum interval between applications is 10 days for pome fruits and 7 days for stone fruits

Reduced risk insecticide: Altacor

By: Christelle Guédot, University of Wisconsin, Entomology

Altacor is registered for use in Wisconsin on pome fruits, including apple, crabapple, pear, and quince as well as stone fruits, including apricot, sweet and tart cherry, nectarine, peach, and plum. It was first registered around 2008 so you may have some experience with it. It is marketed by Dupont® under the formulation 35WG (35% of active ingredient as Water dispersible Granules). Altacor is in the class of the anthranilic diamides with a different mode of action acting on the insect ryanodine receptors in the muscles, causing an uncontrolled release of calcium in the cells. Altacor contains the active ingredient Rynaxypyr also known as chlorantraniliprole. Altacor is most effective through ingestion of treated plants but also has contact activity. Affected insects will rapidly stop feeding, become paralyzed and eventually die within 1-3 days. Applications should be timed to the most susceptible insect stage, typically egg hatch and/or newly hatched larvae. Apply at or before egg deposition for best results.

Altacor is registered for control of green fruitworm, spotted tentiform leafminer, codling moth, eastern sawfly, European corn borer, oblique banded leafroller, oriental fruit moth, red banded leafroller, tufted apple bud moth, variegated leafroller, omnivorous leafrollers, peach twig borer, and katydid (nymphs).

In our previous trials conducted at the Peninsular Research Station in 2014, Altacor showed good activity against green fruitworm and codling moth 1st and 2nd generations. Damage from other insect pests were not assessed or the insects were not present in the plot tested.

Altacor may be applied by ground equipment, overhead chemigation, and by air (see label for specific application regulations). For ground applications, use a minimum of 30 gallons per acre and do not apply dilute applications of more than 200 gal water per acre. Apply 100-150 gal water per acre for best results.

A chemical is considered toxic to bees if its toxicity (measured as the LD50 or Lethal Dose required to kill 50% of the test population) is below 11 µg/bee. Altacor has an LD50 of 119µg/bee, thus it is not considered toxic to bees. While Altacor is safe to spray during bloom, as a general rule, avoid spraying pesticides when bees are actively foraging and concentrate your spraying earlier or better later in the day.

Altacor is toxic to aquatic invertebrates 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 Altacor at the following link:
*www.agrian.com/pdfs/DuPont_**Altacor**_Insect_Control_**Label**1z.pdf*

Apple thinning recommendations after the frost: a case-by-case scenario.

By: Amaya Atucha, UW-Extension State Fruit Specialist

Because we have such a wide spectrum of damage - from 5 to 100% - in our apple crop this year, I thought it would be a good idea to provide some guidelines on thinning strategies and considerations for this unusual season.

First of all, it is imperative for growers to keep track of what is happening in terms of fruit set and drop, especially if Promalin was applied. To help predict fruitlet abscission in a "normal" season, Michigan State University's Precision Crop load Management tool (http://msue.anr.msu.edu/uploads/files/PredictingFruitset1-21-14.pdf) recommends tagging 15 blossom clusters at the pink stage on 5 trees per block at pink (75 total clusters) and use them to track growth starting at 6 mm. After a frost you can use this same tracking methodology to predict which fruits will drop due to cold damage. Pay special attention to blocks located in high and low ground, to assess the variability of the damage within your orchard.

Growers with substantial damage should wait longer before thinning (12-18 mm), as fruit set will be more easily determined at that growth stage. Waiting until fruit is 12-18 mm is also recommended if damage to spur leaves is present. Fruit under 12 mm rely mostly on carbohydrates provided by spur leaves, however, after 12 mm the bourse shoot will become the main source of carbohydrates to the growing fruits. When spur leaves are damaged, thinning before 12 mm could result in over thinning.

On blocks with light frost damage where Promalin was applied it is possible to have a higher percentage of fruit set than desired. If waiting to thin after 12 mm, an increase in the NAA rate of 10-20% is recommended. However, take in consideration that trees with frost damage and those sprayed with Promalin will thin easier. In sites with damage to spurs a lighter thinner spray would be recommended (e.g. MaxCel at 32 oz/100 gal). Carbaryl alone or MaxCel alone are both weak thinners.

Do not apply nitrogen fertilizer in blocks with substantial damage, as this will encourage vegetative growth and reduced fruit set. Applications of Apogee to control shoot growth can help in trees with low fruit set.

If you have a high percentage of damage (90-100%), most likely any fruit that will survive will have some damage or blemishes (i.e., frost rings) and poor internal fruit quality. In this scenario growers might consider removing all the fruit that is left, so that they can reduce some of their sprays for controlling insects and diseases that affect exclusively fruit, however growers should be cautious regarding reducing all spraying as this might result on higher pest pressure for next year. To drop all the fruit off the trees you can use a combination of NAA + Carbaryl at petal fall and another application at 8-10 mm, or you can also use 6BA (MaxCel, RiteWay, or Exilis Plus) + Carbaryl. If you are past 18 mm, then there are only two chemistries that will have thinning activity, Carbaryl and Ethephon. Avoid nitrogen fertilizer, as these trees will be very vigorous due to the lack of fruit to control shoot growth. Application of Apogee, at a higher rate than normal years, will help control vigor. Apogee can be applied starting at full bloom and repeated 2, 4 and 6 weeks after full bloom.

Always make sure you read the label before using any products.

Cider apple trees – growing to meet demand

By: Herdie Baisden

Golden Russett, grafted in April 2015. Photo by Marlene Meyer.

There is a growing demand for hard cider in the US, and this is driving a demand for cider apples. Cider consumption in the U.S. grew 10.6 percent per year, on average, or 65 percent overall, from 2011 to 2016. During this same period, beer as a whole was down 1 percent. If that growth rate continues, says Michigan State University researcher Nikki Rothwell, nearly 10 percent of the U.S. apple supply will go into hard cider by 2018. This expanding industry offers opportunities for Wisconsin orchardists to improve their bottom lines by adding a new market for their low value fruit and adding new apple varieties specifically suited for fermentation to meet the demand from hard cider makers in the state.

This was the focus of discussion at the Cider Apple Field Day held on May 10th at Kickapoo Orchard in Gays Mills, WI. Sponsored by the Wisconsin Apple Growers Association (WAGA), the event brought together growers, researchers and thought leaders to tackle the opportunities and challenges offered by this growing industry. Keynote speaker Dr. Carol Miles, shared her knowledge on cider-apple research in Washington State – including information on choosing apple varieties, establishing a cider orchard, and mechanical harvest research. The table below shows the 20 most commonly planted cider cultivars in the U.S.

TWENTY COMMONLY PLANTED CIDER CULTIVARS:

The cider apple cultivars most commonly mentioned for planting in different regions of the U.S. are shown below.

Cultivar	Type	Origin
Ashmead's Kernel	SH	England
Brown Snout	BSW	England
Chisel Jersey	BSW	England
Dabinett	BSW	England
Golden Russet	SH	USA - Heritage
GoldRush	SH	USA - Modern
Harrison	SH	USA - Heritage
Harry Masters' Jersey	BSW	England
Kingston Black	BSH	England
Michelin	BSW	France
Nehou	BSW	France
Newtown/Albemarle Pippin	SH	USA - Heritage
Porter's Perfection	BSH	England
Redstreak, Hereford	SH	England
Roxbury Russet	SH	USA - Heritage
Tramlett's, Geneva[1]	BSH	England
Virginia Crab (Hewes)	BSH	USA - Heritage
Wickson Crab	BSH	USA - Modern
Winesap	SH	USA - Heritage
Yarlington Mill	BSW	England

[1] Unknown variety received from Geneva, NY germplasm repository as Tramlett's Bitter (incorrectly).

Dr. Carol Miles offering tannin training on cider

Dr. Miles presented information from the Washington State University (WSU) research on the growth habits and characteristics of these and other varieties, along with the results of juice analyses and the evaluation of varietal ciders produced at WSU Mount Vernon NWREC. She pointed out that some of the cultivars used for making cider are easier to grow than others: "Factors to consider when choosing cultivars include disease resistance or susceptibility, growth and bearing habit (e.g. tip bearing, biennial bearing), and adaptability to local climate and soil conditions."

One of the characteristics of many cider apple varieties is biennial bearing. Dr. Amaya Atucha, UW Assistant Professor/Fruit Crop Specialist, provided insight into the phytophysiological factors underlying biennial bearing – most importantly the distribution of hormones. Growers may need to be more attentive to thinning to promote more annual bearing of cider apples.

The research by Matt Stasiak, Superintendent of the University of Wisconsin Peninsula Agricultural Research Station (PARS) aims to provide more information about the suitability of select cider varieties for growing in Wisconsin. He pointed out at the Cider Apple Field Day that research station trials are underway to evaluate 15+ cultivars in terms of their precocity, bloom and harvest dates, yield (fruit, juice volume/weight), biennial rating, cider quality, sugars (% soluble solid, brix), and acidity (pH & titratable malic acid). Outreach specialist Matthew Raboin, University of Wisconsin Center for Integrated Agricultural Systems (CIAS), discussed grants they received to do cider related research at UW. He also shared results from tests conducted at his orchard.

The need for more site-specific research was highlighted Dr. Miles: "Since the best apples for cider making need to be fully mature at harvest, some cultivars may need more heat, while others perform better in cool maritime regions." This was a key factor in the design of grower field trials funded through the USDA Specialty Crop Block Grant received by WAGA. At the Cider Apple Field Day, each of 10 growers received 15-25 trees to participate in grower field trials of selected cider apples – including five bittersweet, two bittersharp, and one sweet cider variety. Growers will collect and submit data on their efforts using a survey tool developed by Matthew Raboin and staff at the University of Wisconsin Center for Integrated Agricultural Systems (CIAS).

The economics of growing cider apples is a key interest of growers considering this venture. The per acre cost and returns of establishing and producing cider apples in Western Washington State provided growers with a glimpse of what they might consider for Wisconsin. WAGA president Sara Ecker presented a tool that cider makers could use in contracting with growers to grow cider-specific apples. These "grower contracts" are not typically used by Wisconsin apple growers, but are being piloted. Herdie Baisden, program manager for the WAGA Specialty Crop Block Grant, reported on contracting efforts by Kickapoo Orchard and Maiden Rock Winery & Cidery.

Using a template and a sample contract developed by cider and brandy maker Charles McGonegal, ÆppelTreow Winery & Distillery, in Burlington, WI, Kickapoo Orchard and Maiden Rock Winery & Cidery drafted a "contract" that served to guide their discussion and agreements. Maiden Rock provided the scion wood to be top-worked onto Kickapoo Orchard trees. Participants at the Cider Apple Field Day got a chance to see these grafts as they move into the 2016 growing season. Andy Meyer, manager of Kickapoo Orchard, says that the grafts grew so well that he planned to use some of this wood to finish off their grafting in 2016.

These are some of the efforts that can help to reestablish true cider apple varieties in Wisconsin. As Nikki Rockwell emphasizes, the U.S. apple industry not only needs more cider apples, but better varieties. And those varieties need to work for key stakeholders – including cider makers, growers and nurseries.

Calendar of Events

June 14, 2016 – Monroe and Richland County Fruit Field Day
9:30-4:00, Field of Dreams Blueberries, 23897 Destiny Avenue, Tomah and Lazy Patch Farm, 33351 State Rd 154, Hill Point

June 16, 2016 – WGGA Vineyard Walk
3:00-6:30 pm, Dancing Dragonfly Winery, 2013 120th Ave, St Croix Falls

June 16-19, 2016 – Cranberry Blossom Festival
Wisconsin Rapids, WI

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

July 12, 2016 – WAGA Summer Field Day
Apple Holler, Sturtevant, WI

July 14, 2016 – PARS Vineyard Walk
Peninsular Agricultural Research Station, 4312 Hwy 42 North, Sturgeon Bay, WI

June 15, 2016 – Advanced Organic Orchard Management Field Day
9:00-4:30, Atoms to Apples, Mount Horeb, WI and Two Onions Farm, Belmont, 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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