Northern Michigan FruitNet 2018
Northwest Michigan Horticultural Research Center

Weekly Update

FruitNet Report – July 17, 2018

CALENDAR OF EVENTS

8/23	**NWMHRC Open House**

What's new?

- **Northwest Regional Report – July 17, 2018**
- **Hanging light fixture left behind at the NW Station**

New articles

Northwest Regional Report – July 17, 2018

Sweet and tart cherry harvests are well underway; we will harvest tart cherries at the research station this week.

Emily Pochubay and Nikki Rothwell, MSU Extension

Weather and Crop Report

The trend of warm and dry conditions was temporarily interrupted by rainfall that totaled 0.29" at the research station on 12-14 July. Temperatures have continued to be warm, in the 80s over the last week. Although the early part of this week has been cooler, temperatures are predicted to bounce back up into the 80s mid-week and drop down again by the end of the week. Wet weather is also in the forecast for the weekend with the greatest chance for rain on Friday 20 July and Saturday 21 July; there is also a possibility of rain predicted for Sunday and Monday, 22-23 July. According to Enviroweather totals, we have accumulated 1965 GDD base 42 degrees F and 1322 GDD base 50 degrees F since 1 January.

Sweet and tart cherry harvest is underway in the region, and we will begin harvesting tart cherries at the station this week. Small size of cherries has been a concern this season, and rain late last week helped to size some varieties. We hypothesize that hot and dry weather played a significant role in these smaller cherries, particularly sweet cherries, and we are currently collecting data to establish how much of a role weather played in fruit size. Apples quality is looking good thus far, and our high-density apples under irrigation at the station have been steadily sizing despite the lack of rainfall.

Pest Report

Cherry harvest is underway, and most orchards have very little disease incidence as a result of a drier season. **Cherry leaf spot** infections were possible during variable wet weather late last week 13-14 July, but there is very little leaf spot in orchards at this time. **American brown rot** incidence also remains low, but we have received reports of isolated orchards with **American Brown Rot** infections. The current forecast is calling for a rainy weekend; multiple days of wet weather and high humidity will be conducive for diseases, and if cherries crack, the potential for brown rot will be concerning. **Powdery mildew** has also continued to spread at the research station as well as in commercial blocks.

Spotted wing drosophila (SWD) trap numbers decreased last week, and we hypothesize that recent wet weather will stimulate SWD activity; traps will be checked and data will be reported later this week. Previous research has shown that hot and dry conditions like those we experienced in early July are related to decreased SWD activity. Despite lower trap catches last week, the total numbers of flies in traps this season suggest that SWD populations are higher this season than previous seasons. Fortunately, the weather has been conducive for good coverage and growers have been extra cautious with management programs to ensure clean fruit at harvest. Please refer to *SWD Update for Cherry Growers – July 13, 2018*, for additional information.

Most **San Jose scale** crawlers are settling down and developing protective waxy coatings that will cover the scales as they mature into adults. Most sprays will not be effective against crawlers that have developed this waxy coating. As mentioned in last week's report, we will monitor for the late summer male flight and crawler emergence to assist growers' with timing post-harvest management tactics.

Two spotted spider mite numbers have continued to build in tart cherry blocks at the station, and numbers are also building in commercial blocks. Mite management may be needed to prevent premature leaf loss.

Obliquebanded leafroller (OBLR) flight is ongoing and trap numbers have continued to decline this week. We have continued to receive reports of larvae in commercial blocks.

We have not detected **cherry fruit fly** at the station this season, but this pest has been detected in our region.

In apples, **codling moth** numbers were down to zero this week. Based on our biofix 28 May, we have reached 966 GDD base 50 degrees F. Degree day predictions suggest that we will reach 1060 GDD base 50 by the end of this week. Although evening temperatures are predicted to be a little cooler for the next few days, we could see second generation flight by the end of the week or early next week as temperatures are predicted to warm again into the 60s in the evenings.

We have not detected **apple maggot** at the station at this time.

Table 1. Avg. number of cherry and apple pests in the NWMHRC trap line by date.

Cherry - NWMRHC	**7-May**	**14-May**	**21-May**	**28-May**	**4-June**	**11-June**	**18-June**	**25-June**	**2-July**	**9-July**	**16-July**
APB	0	0	5	6	7	7	6	0	1	7	22
LPTB			Set	4	11	11	3	1	12	4	4
GPTB				Set	1	0	1	0	0	1	5
OBLR					Set	0	8	19	10	1	2
CFF					Set	0	0	0	0	0	0
Apple - NWMHRC	**7-May**	**14-May**	**21-May**	**28-May**	**4-June**	**11-June**	**18-June**	**25-June**	**2-July**	**9-July**	**16-July**
OFM	Set	0	0	0	0	0	0	0	0	0	0
STLM	Set	13	18	32	25	1	1	4	5	10	24
CM		Set	0	1	8	1	3	0	1	3	0
OBLR					Set	0	2	3	1	1	0
AM									Set	0	0

APB = American Plum Borer
LPTB = Lesser Peachtree Borer
GPTB = Greater Peachtree Borer
CFF = Cherry Fruit Fly
OFM = Oriental Fruit Moth
STLM = Spotted Tentiform Leafminer
CM = Codling Moth
AM = Apple Maggot

Hanging light fixture left behind at the NW Station

After the 2018 Industry Day presentation at the NW Station, we found that someone left behind a hanging light fixture. If this is yours, please call the station at 231-946-1510 or email Jenn at goodr100@msu.edu.

Articles featured in past FruitNet Reports

SWD Update for Cherry Growers – July 13, 2018

Nikki Rothwell, Emily Pochubay, and Karen Powers, NWMHRC

The 2018 SWD numbers are 6X higher than in past years at this time during the season. Although SWD trap numbers are down this week, growers should be cautious with management decisions as rain, humidity, and wet weather will likely stimulate SWD activity.

As cherry harvest is underway, growers are balancing management decisions with pre-harvest intervals (PHIs), and the rainy forecast for the weekend and early next week. This season has been mostly dry and hot, and we hypothesize that these conditions have been less conducive for spotted wing drosophila (SWD) activity. Previous data have shown that SWD activity decreases at temperatures above ~86 degrees F, and egg laying is inhibited at ~91+ degrees F. In addition to temperature, SWD flies also prefer higher relative humidity. In a blueberry field study, they found that ambient temperature was not correlated to seasonal adult captures, but relative humidity played a significant role; higher humidity was directly correlated with higher trap catches (Tochen, et al. 2015). They also found that SWD survival is reduced and reproduction decreases at 20% relative

humidity. Other previous research has shown that there is an interaction between temperature and humidity. For example, insect survival improves in hot conditions when humidity is high rather than low. This season's weather events are likely influencing SWD population growth and activity.

Thus far this growing season, overall SWD trap catch is actually higher than in past years despite the slow start and multiple weeks with zero trap. Again, we hypothesize that this hot and dry weather is affecting SWD activity in cherry orchards. As mentioned above, this week's SWD trap catches are down substantially over last week's catches (Table 1). Last week, we caught a total of 420 flies compared to this week's total of 236 flies. Growers and consultants may see this week's lower numbers and think that this decrease is a result of successful spray programs. While good SWD management is helping to delay fly population growth, the region's recent weather is likely the important driving factor in decreasing trap counts rather than spray programs.

Table 1. SWD trap counts in northwest Michigan, 2018

	wk of 5/15	wk of 6/4	wk of 6/11	wk of 6/18	wk of 6/26	wk of 7/2	wk of 7/9
North Manistee	trap set	0	0	0	0	16	2
Benzie	trap set	0	0	2	0	90	10
Yuba	trap set	0	0	0	0	40	19
Central Lake	trap set	0	0	0	0	1	3
Old Mission	trap set	1	0	1	0	12	3
Suttons Bay	trap set	0	0	1	1	3	2
Cedar	trap set	0	0	0	0	50	84
East Leland	trap set	0	0	0	0	25	0
Northport	trap set	0	0	0	1	15	3
NW Station (unsprayed)	NA	trap set	1	2	3	180	110

The 2018 trap counts appear to fluctuate whereas the 2016 and 2017 trap counts started to build slightly earlier but remained steady as the season progressed (Figure 1). The overall numbers of flies caught in 2016 and 2017 were also significantly lower than the 2018 trap counts. At this same time in 2016 and 2017, we caught an average of ~ 1 fly compared to an average of~6 flies in 2018. Because we have had many zeros in our traps until the past two weeks, we assumed SWD populations were relatively low in the region. However, the data indicate that the SWD populations are high, especially compared with past seasons. This information is startling, and growers should be diligent about managing SWD this season.

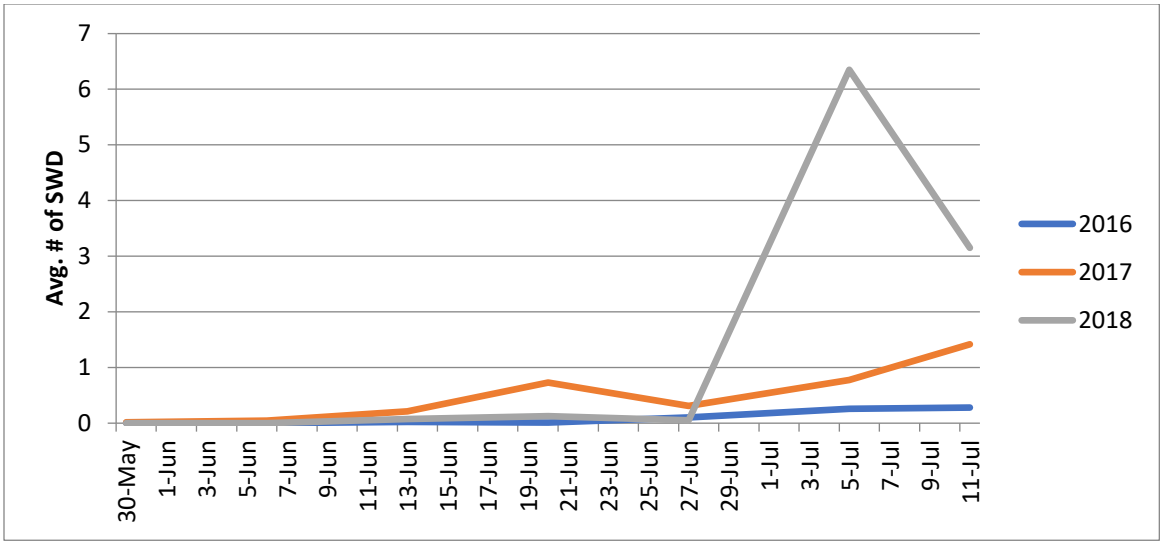

Figure 1. Average number of SWD flies captured in traps in NW Michigan: 2016-2018.

We reviewed rainfall events at the Northwest Michigan Horticultural Research Center's (NWMHRC) Enviroweather station for this season, and we received 3.0" of rain in May, 2.06" in June, and 0.47" thus far in July. These rainfall totals are similar to our 37-year averages: 2.75" in May, 3.09" in June, and 2.35" in July, but hot temperatures have quickly dried this moisture in the region. A combination of late cold spells followed by these dry and hot conditions likely contributed to the slow start but sudden rise of SWD populations as reflected in our 2018 trap count data. The flies almost appear to be 'waiting' for moisture. We received 0.33" of rainfall on 1 July, and trap counts for the week of 2 July increased substantially: 420 flies the week of 2 July compared to 5 flies the week of 25 June; this is a 84x increase in fly catch. This rainfall event/increased moisture likely triggered this substantial increase in SWD trap catch. Hence, SWD fly activity has been depressed with the dry conditions, and even with a small amount of moisture, SWD have become significantly more active.

Since 1-2 July, we have had little rain in much of the region (until last night's rain event), and the SWD trap counts for the week of 9 July were back down to ~less than half of the prior week's counts. This week (9-13 July), daytime temperatures were in the mid-80s with low relative humidity and extremely dry orchard conditions. The lack of humidity and dry conditions likely decreased SWD activity during this past week, which is reflected in our trap count data. However, growers should note that even if the fly counts are down by almost half compared to last week, the numbers are still 3X higher than at this time in 2016 and 2017.

The region received varied amounts of rainfall this week, and the current relative humidity at the NWMRHC is 68% (13 July). There is more rain in the forecast for tonight (13 July) and again on Monday (16 July). Based on our recent observation of the relationship of SWD trap catches and moisture, we hypothesize that wet conditions will facilitate higher humidity and stimulate greater SWD activity over the coming days. We are particularly concerned about the combination of wetter conditions and fly activity as the SWD populations are substantially higher than they have been in past years. In short,

we have caught on average 6X more flies at this time in the season compared with the last two years. Dry conditions may have kept the SWD trap catches seemingly low this season, but growers should not become complacent with management programs as this wet weather will likely increase SWD activity, and spray intervals should not be stretched.

For applications over the weekend, we suggest using a product rated 'excellent' with a 14-D PHI in blocks where harvest will not occur for 14+ days, if this is an option. We remind growers that there is a 24(C) Special Local Need Label for Mustang Maxx that allows an application at a 3-D PHI in tart cherry only. According to this label, there is a maximum of 24 fl oz/A per year (0.15 lb ai/A/year) and a seven-day retreatment interval requirement. This could be a long harvest season, particularly for tart cherries, and this label will be a helpful tool for tart cherry growers as they approach harvest. Please review the 24(C) label and other labels for additional information prior to applications.

Literature Cited

TOCHEN, S., J.M. WOLTZ, D.T. DALTON, J.C. LEE, N.G. WIMAN, AND V.M. WALTON. 2016. HUMIDITY AFFECTS POPULATIONS OF *DROSOPHILA SUZUKII* (DIPTERA: DROSOPHILIDAE) IN BLUEBERRY. JOURNAL OF APPLIED ENTOMOLOGY. VOLUME 140. ISSUE1-2. 47-57PP.

Wiman N.G., V.M. Walton, D.T. Dalton, G. Anfora, H.J. Burrack, J.C. Chiu, K.M. Daane, Grassi, B. Miller, S. Tochen, X. Wang, C. Ioriatti. 2014. Integrating temperature-dependent life table data into a matrix projection model for Drosophila suzukii population estimation. PLoS One 9:3106909. doi:10.1371/journal.pone.0106909

Predicted 2018 Apple Harvest Dates

Philip Schwallier, District Horticulture Educator
Amy Irish-Brown, District ICM Educator
Clarksville Research Center

The predicted harvest dates for every MAWN weather station is now available on Enviroweather web site at Michigan State University. This spring was colder then average which delayed the development of spring foliage. Then warmer weather arrived and bloom developed 7 behind normal in the south to 2 days behind normal in the north part of the state. Record hot temperatures followed thus advancing harvest dates to predict near normal dates for 2018 for the state. In general, 2018 Predicted Harvest Dates are roughly normal in the south and a few days early in the north. Bloom dates this spring were late across the state.

As always, the weather seems to be unusual each year and 2018 was no different. It began with what appeared to be another very late spring. Most areas bloomed late except northern areas of the state. During April very cold weather moved in several times leaving low areas and sensitive varieties with minor frost damage. In general, apple blocks have a mix of cropload, some light areas but mostly moderate to heavy cropload. Blocks with light croploads will mature 3 or 4 days sooner then the predicted harvest dates. Heavy croploads will mature 7 days later than the predicted dates. If hot stressful weather occurs in August or September, apple maturity will be advanced. The 2018 predicted harvest dates are listed in Table 1. This year 2018, we are a few days behind last year. Table 2 lists this year's predictions compared to normal and last year.

The normal harvest dates for other varieties are listed in Table 3 for the Grand Rapids area. This year's 2018 predicted dates for other non-modeled varieties are a rough estimate based on the McIntosh, Jonathan and Red Delicious predicted dates. Other areas of the state should adjust non-predicted varieties based on their own history. ReTain application should be applied 30 DBH (days before harvest). Harvista can be applied 3 to 7 DBH. Use Table 3, 2018 Predicted Harvest Dates for Other Varieties, to time ReTain applications and adjust for varieties and locations.

Table 1. 2018 predicted peak harvest dates.

Full bloom date 2018				Predicted harvest date 2018			
Station	**McIntosh**	**Jons**	**Reds**	**McIntosh**	**Jons**	**Reds**	**Observer**
SWMREC	11-May	13-May	14-May	8-Sep	24-Sep	1-Oct	Shane
Deerfield	8-May	9-May	10-May	5-Sep	22-Sep	29-Sep	Tritten
Romeo	13-May	14-May	15-May	10-Sep	25-Sep	30-Sep	Tritten
Peach Ridge	16-May	17-May	17-May	14-Sep	26-Sep	2-Oct	Irish-
Hart	21-May	22-May	23-May	19-Sep	30-Sep	7-Oct	Irish-
NWMHRS	22-May	23-May	23-May	20-Sep	2-Oct	8-Oct	Rothwell

Table 2. 2018 predicted peak harvest dates compared to normal and last year.

Days ahead of normal				Days ahead of last year		
Station	**McIntosh**	**Jons**	**Reds**	**McIntosh**	**Jons**	**Reds**
SWMREC	-1	-3	-3	-11	-9	-9
Deerfield	3	-1	3	-7	-4	-4
Romeo	3	0	3	-8	0	1
Peach Ridge	1	0	3	-9	1	2
Hart	-1	3	7	-6	0	-1
NWMHRS	2	4	9	-1	6	6

Table 3. Normal and 2018 peak harvest dates for varieties for the Grand Rapids area

Variety	Normal date	2018 predicted date
Paulared	8/24	8/24
Gingergold	8/26	8/26
Gala	9/10	9/10
McIntosh	9/15	9/14
Honeycrisp	9/18	9/18
Empire	9/24	9/24
Jonathan	9/26	9/26
Jonagold	9/26	9/26
Golden Delicious	10/2	9/28
Red Delicious	10/5	10/2
Idared	10/10	10/9
Rome	10/15	10/14
Fuji	10/25	10/25
Braeburn	10/25	10/25
Goldrush	11/1	11/1

Project GREEEN Drone Workshops

Background: Thanks to a grant from AgBioResearch at MSU, RS&GIS and Dr. Bruno Basso will be conducting a series of **free** Drone workshops over the next two years, for growers across the state. Through these workshops, growers will develop an understanding of drone- based data collection and analysis with specific application to their commodity groups. Each of the 2-day workshops will target a specific commodity group including: tree & bush fruits, viticulture, nursery stock, and row crops.

Registration: **https://goo.gl/forms/UQDAnHWxBpRtnopz2**

Agricultural Specialization (Commodity Group)	Location	Date
Tree / Bush Fruit	Southwest MI Extension Center, Benton Harbor	August 9 -10, 2018
Grapes	Northwest MI Horticulture Research Center, Traverse City	September 13 – 14, 2018

Nursery Stock	Michigan State University, East Lansing	September 6-7, 2018
Row Crops	TBD	TBD

Overall Attendees will:

- Learn the essential elements required to safely conduct commercial flight and mapping operations in the National Airspace System including flight planning and preparation
- Take part in hands-on drone flights both manual and autonomous.
- Develop an understanding of analysis techniques and applications in precision ag
- Gain a brief overview of Remote Sensing and its management applications.
- Leave the course with a clear understanding of the Drone-to-GIS workflow, including planning and completing missions, processing data and analyzing said data in GIS

Space is limited, if you are interested in attending please register and answer the questions at: https://goo.gl/forms/UQDAnHWxBpRtnopz2

Interested parties must sign up by July 25, 2018, we will confirm your spot by August 1, 2018.

Please contact Erin Bunting (ebunting@msu.edu) or Bruno Basso (basso@msu.edu) for more information

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WEB SITES OF INTEREST:

Farmer to Farmer – Connecting farmers, cultivating community
http://www.f2fmi.com

Insect and disease predictive information is available at:
http://enviroweather.msu.edu/homeMap.php

This issue and past issues of the weekly FruitNet report are posted on our website:
http://www.canr.msu.edu/nwmihort/nwmihort_northern_michigan_fruit_net

60-Hour Forecast:
http://www.agweather.geo.msu.edu/agwx/forecasts/fcst.asp?fileid=fous46ktvc

Information on cherries:
http://www.cherries.msu.edu/

Information on apples:
http://apples.msu.edu/

Information on grapes:
http://grapes.msu.edu