Northern Michigan FruitNet 2018
Northwest Michigan Horticultural Research Center

Weekly Update

FruitNet Report – June 5, 2018

CALENDAR OF EVENTS

5/8 – 6/27	**IPM Updates**
6/22	**Farmer Field Day - SOIL, STEWARDSHIP & FARM LONGEVITY** *RSVP here:* https://www.eventbrite.com/e/farmer-field-day-tickets-45485784205?aff=eac2

What's new?

- **Northwest Regional Report – June 5, 2018**

New articles

Northwest Regional Report – June 5, 2018

With the recent heat and moisture, tree growth has accelerated and fruit is sizing quickly. Thinning is a priority for growers this week.

Nikki Rothwell and Emily Pochubay, MSU Extension

GROWING DEGREE DAY ACCUMULATIONS AS OF June 4, 2018 AT THE NWMHRC

Year	2018	2017	2016	2015	2014	2013	28 Yr. Avg.
GDD42	723	701	763	714	624	663	709.7
GDD50	420	341	414	380	333	379	366.4

2018 Growth Stages – NW Michigan Horticultural Research Center June 4, 2018

Bartlett Pear – 11 mm fruit
Potomac Pear – 13 mm fruit
Mac – 12 mm fruit
Gala – 9 mm fruit
Red Delicious – 10 mm fruit
HoneyCrisp – 10 mm fruit
Montmorency – 10 mm fruit
Balaton – 10.5 mm fruit
Hedelfingen – 10.5 mm fruit
Gold – 10 mm fruit
Napolean – 10 mm fruit
Riesling – 10" – 16" shoots

Weather Report
The weather across the region has been variable for the past week. The heat wave has ended last Thursday, 30 May. During this warm period, daytime temperatures were in the mid to high-80s and into the 90s. Nighttime temperatures were also warm, and we hovered in the 60s for the overnights. Temperatures dropped over the weekend to more seasonal conditions. We have accumulated 723GDD base 42 and 420GDD base 50. These accumulations have increased considerably with the recent heat, and before these high temperatures, we were behind our 20+ year average. Currently, our growing degree-day accumulations are above average by a few days. We have also had multiple rainfall events in the past week. At the NWMHRC, we received the following rainfall amounts: 0.2" on 30 May, 0.33" on 31 May, 0.22" on 1 June, 0.36" on 3 June, and 0.03" on 4 June. The total amount of rainfall at the NWMHRC for the past week was just less than 1.25".

Crop Report
The combination of heat and recent rainfall has accelerated tree growth. We have tremendous growth on apples and sweet cherries at the NWMHRC. With the increased growth, growers need to be sure to be covered prior to rain events. Because of the heat of recent weeks, crop development over the Michigan fruit belt is considerably close. Development of fruit crops is comparable in all fruit growing regions in the state, which is noticeably more similar than in years past. Almost all tree fruits in the northwest region, sweet and tart cherries and apples, are at the 10-12mm in size at this time.

We are still estimating the crop load at this time. The sweet cherry crop is sizing well, and there seems to be a good set. However, we are just starting to see some fruit color and these fruits are likely going to drop. The tart cherry crop also appears to be sizable, but we have had reports from growers about a lighter crop than expected in particular areas of northwest Michigan. However, the overall US tart cherry crop is looking big at this time. We had considerable bloom in apples, and the Michigan crop is estimated to be excellent. We are recommending that growers be diligent about thinning to obtain good size and fruit quality.

Thinning should be on all apple growers' minds this week. The current weather conditions are cool, which is not optimal for thinning applications. However, depending on the forecast, temperatures are predicted to rise for the remainder of the week with rain in the forecast on Saturday. Chemical thinners work best above 65 degrees F, and Wednesday and Thursday, 6 and 7 June have predicted highs in the mid-60s. This forecast suggests that aggressive thinning is needed to reduce the size of the crop and to minimize hand thinning later in the season. According to Phil Schwallier, we began this season with a tremendous capacity for a large crop, and growers will need to work to reduce the size of the crop to achieve high quality fruit. Data collected from the Clarksville Research Center shows that we have a high number of fruit setting per numbers of clusters measured (Figure 1). These data indicate that we have to be diligent in thinning efforts to achieve that target number of fruits per cluster.

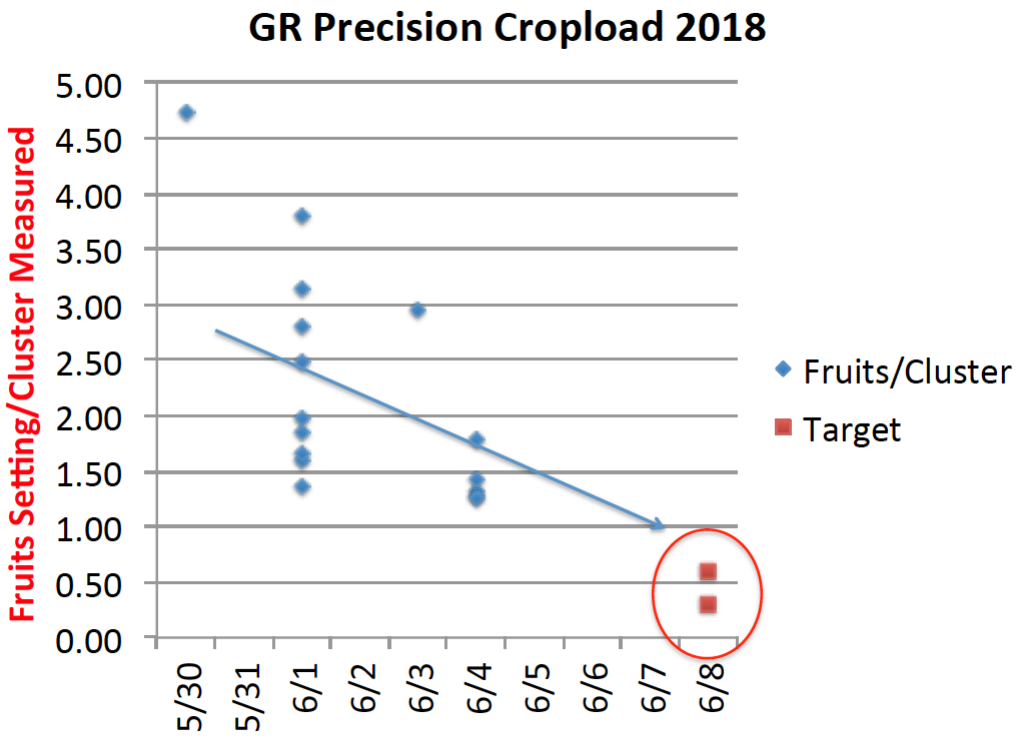
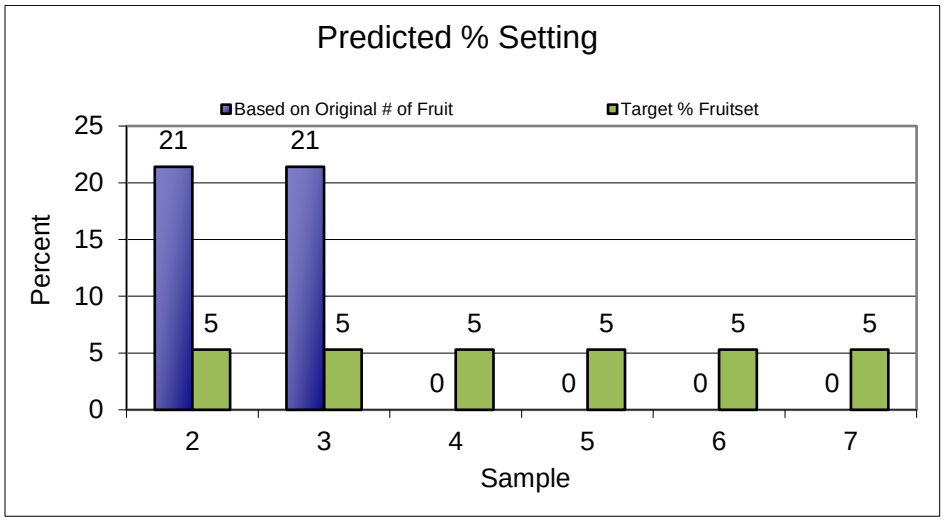
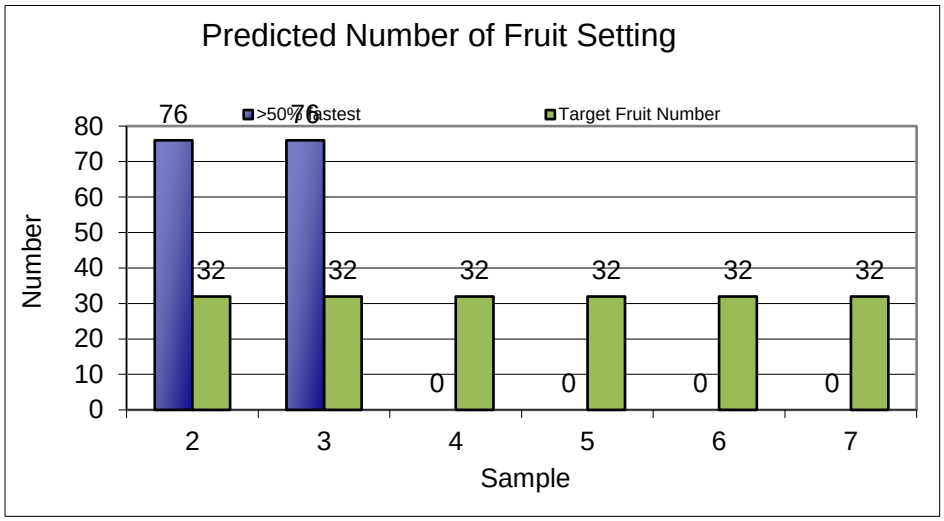


Figure 1. Fruit setting/cluster measured at the Clarksville Research Center.

We have been conducting precision orchard management measurements at the NWMHRC in a block of Honeycrisp planted in 2013. Based on initial measurements, the canopy had the potential to produce 600 fruits per tree, and the optimum crop load is 32 apples per tree (5% of the initial crop load). We applied Maxcel at 1qt per 100 gallons on 24 May. We measured fruitlets again on 29 May, and our number of fruits per tree was reduced to ~76, approximately 21% of the target crop load (Figures 2 and 3).





This crop reduction was due in part to the thinning application but also be due to natural thinning (perhaps in the recent heat) as well as other factors such as pollination. We held off on spraying thinner over the weekend, and measured the fruitlets on Monday 4 June. The number of expected fruit per tree (i.e. crop load) did not change over the weekend, and we are still at ~21% of our target crop load. These data indicate that we need to apply another thinning application to remove more fruits from the trees. We will apply NAA at 8oz, a quart of Sevin, and a surfactant. Additionally, fruitlets are sizing and many of the fruits measured yesterday range from 4-9mm in size, which are approaching the optimum thinning window. Lastly, the most recent carbohydrate model for the NWMHRC suggests that there will be no stress in the coming days, and our tree

carbohydrate status is a +38-42g/day. This model recommends increasing the rate of chemical thinners by 30%, and this model echoes Phil Schwallier's recommendations to thin aggressively.

Apple Carbohydrate Thinning Model for nwmhrs

Apple Carbohydrate Thinning Model Results								
Date	Max Temp (°F)	Min Temp (°F)	Solar Rad (MJ/m2)	Tree Carbohydrate Status (g/day)				Thinning Recommendation
				Production	Demand	Balance	4-Day Ave Balance	
5/1	79	62	21.8	0.00	18.37	-18.37	-14.8	-
5/2	70	49	13.6	0.00	15.62	-15.62	-15.49	-
5/3	59	44	18.4	0.00	11.91	-11.91	-15.84	-
5/4	62	42	14.6	0.00	13.28	-13.28	-16.33	-
5/5	70	50	24.0	0.32	21.48	-21.16	-21.06	-
5/6	63	47	20.6	1.36	18.38	-17.02	-22.02	-
5/7	70	37	26.8	3.49	17.34	-13.85	-19.05	-
5/8	82	55	24.9	1.33	33.53	-32.20	-16.48	-
5/9	73	47	7.5	0.00	25.00	-25.00	-10.3	-
5/10	56	38	22.8	7.23	12.39	-5.16	-6.68	-
5/11	50	34	13.0	4.77	8.33	-3.56	-10.55	-
5/12	62	40	24.2	8.73	16.22	-7.49	-12.47	-
5/13	67	44	26.7	10.24	20.73	-10.49	-13.38	-
5/14	74	51	19.6	6.94	27.62	-20.68	-11.08	-
5/15	68	52	26.2	12.56	23.77	-11.21	-6.68	-
5/16	78	48	27.3	14.51	25.64	-11.13	-6.92	-
5/17	68	47	26.4	17.64	18.95	-1.31	-0.71	-
5/18	75	49	27.1	18.51	21.59	-3.08	-0.43	-
5/19	63	48	7.5	2.88	15.03	-12.15	2.13	-
5/20	62	39	26.1	24.60	10.93	13.68	5.28	-
5/21	67	43	14.2	13.34	13.52	-0.17	-0.87	-
5/22	67	51	25.7	24.42	17.27	7.15	-10.3	Apply standard chemical thinner rate
5/23	77	51	27.1	25.69	25.22	0.47	-21.39	Decrease chemical thinner rate by 15%

Apple Carbohydrate Thinning Model Results

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				Production	Demand	Balance	4-Day Ave Balance	
5/24	81	56	26.8	24.69	35.62	-10.94	-32.41	Decrease chemical thinner rate by 15%
5/25	87	66	25.1	17.90	55.78	-37.87	-42.59	Decrease chemical thinner rate by 30%
5/26	83	64	25.7	24.57	61.79	-37.22	-45.7	Decrease chemical thinner rate by 30%
5/27	85	63	27.1	28.90	72.52	-43.62	-55.67	Decrease chemical thinner rate by 30%
5/28	84	60	20.4	24.33	75.99	-51.65	-60.87	Decrease chemical thinner rate by 50%
5/29	89	58	26.0	34.28	84.60	-50.32	-46.08	Decrease chemical thinner rate by 30%
5/30	84	65	14.5	11.77	88.88	-77.11	-31.17	Decrease chemical thinner rate by 15%
5/31	75	67	14.3	15.14	79.54	-64.40	-21.09	Decrease chemical thinner rate by 15%
6/1	69	48	23.1	56.64	49.15	7.50	3.21	Increase chemical thinner rate by 15%
6/2	74	52	28.4	70.27	60.94	9.33	9.54	Increase chemical thinner rate by 15%
6/3	64	53	6.6	12.57	49.37	-36.80	19.32	Increase chemical thinner rate by 15%
6/4	70	51	28.5	85.24	52.44	32.80	37.07	Increase chemical thinner rate by 30%
6/5	61	44	17.2	66.21	33.38	32.83	38.06	Increase chemical thinner rate by

Apple Carbohydrate Thinning Model Results

Date	Max Temp (°F)	Min Temp (°F)	Solar Rad (MJ/m2)	Tree Carbohydrate Status (g/day)				Thinning Recommendation
				Production	Demand	Balance	4-Day Ave Balance	
								30%
6/6	68	43	22.8	87.34	38.88	48.46	32.98	Increase chemical thinner rate by 30%
6/7	70	54	22.3	84.65	50.46	34.19	35.27	Increase chemical thinner rate by 30%
6/8	75	51	21.3	86.92	50.17	36.76	42.53	Increase chemical thinner rate by 30%
6/9	75	57	15.6	67.27	54.75	12.51		
6/10	73	55	25.7	107.17	49.57	57.60		
6/11	73	53	26.1	110.44	47.21	63.23		

Pest Report

Most of the region was wet over the weekend, and these conditions were favorable for tree fruit diseases. Although temperatures have been cooler more recently, orchard pests have been active in the more seasonable temperatures. In this year's seemingly condensed season, plants and insects alike have developed rapidly which has been a challenge for growers to balance orchard tasks. Weeds have grown quickly over the last two weeks; hence, in addition to pest and disease management, mowing and herbicide applications are underway. Keeping the weeds at bay will improve airflow/drainage which can help to minimize pest and disease pressure. Multiple wet days and windy conditions in the last week have not been favorable for spray applications, but the forecast is calling for more moderate temperatures and calm days which will be a good window to get into the orchard before the wet weather that is predicted for the end of the week.

We have not observed symptoms of fire blight infected shoots at this time. Cooler temperatures will slow the disease progress and delay symptoms, but flagging terminals could begin showing up later this week if infection occurred. Many orchards were at petal fall late last week and there will be little fire blight infection risk in cooler weather over the next few days if tag blossoms open. Monday 4 June was very windy and trauma blight could be a concern if windy conditions damaged or tattered leaves or shoots. Additionally, thinning windows are tight this season with rapid fruit growth – it will be a challenge to make these applications.

Primary apple scab progress has continued to move along and according to RIMpro estimates, spore discharge was heavy during rains on 30-31 May and Sunday 3 June. Some of these periods of wet weather were relatively long (from 10-27 hours) and resulted in multiple infection periods across the region. Some areas received rainfall on Friday 1 June, but moisture dried quickly and most areas were a few hours shy of an infection period. At this time, the Ridge area has continued to report apple scab spore discharge at monitored sites and primary apple scab is ongoing across the state. Northwest growers should continue to keep highly susceptible fruitlets and green tissues covered from this disease as well as powdery mildew. The NWMHRC is ~80-90% through primary apple scab at this time, and RIMpro predictions suggest that we will need several more rain events before primary apple scab season is officially over.

Bear Lake (Biofix 1 May) - www.rimpro.eu/faces/venturia.xhtml?id=SBX4czs
Benzonia (Biofix 1 May) - www.rimpro.eu/faces/venturia.xhtml?id=W8AATqc
East Leland (Biofix 1 May) - www.rimpro.eu/faces/venturia.xhtml?id=bQVk0LY
Eastport (Biofix 2 May) - www.rimpro.eu/faces/venturia.xhtml?id=nK5Jcqr
Elk Rapids (Biofix 1 May) - www.rimpro.eu/faces/venturia.xhtml?id=hCoaC6M
Kewadin (Biofix 1 May) - www.rimpro.eu/faces/venturia.xhtml?id=Oa4COcX
Northport (Biofix 5 May) - www.rimpro.eu/faces/venturia.xhtml?id=Bsrm7WU
NWMHRC (Biofix 1 May) - www.rimpro.eu/faces/venturia.xhtml?id=HJzr7Kn
Old Mission (Biofix 1 May) - www.rimpro.eu/faces/venturia.xhtml?id=xPCzX8i
Williamsburg (Biofix 1 May) - www.rimpro.eu/faces/venturia.xhtml?id=wBe9zhP

The NWMHRC's codling moth biofix was set for 28 May. On Friday 1 June, we had an average of seven moths per trap with two new moths detected over the weekend (Table 1). Weekend temperatures were cooler and evening rains were not good conditions for codling moth activity. However, warm conditions last week were ideal, and we had several reports of high moth catches in commercial blocks. In some orchards where trap numbers were above treatment thresholds, growers plan to target codling moth eggs with an ovicide. The treatment timing for the egg stage begins at 100 GDD base 50 after biofix. Degree-days accumulated quickly during the recent warm weather, and the NWMHRC reached 100 GDD on 31 May – just three days after biofix. However, egg laying should continue in the coming days and egg hatch is not expected until 250 GDD base 50 after biofix (i.e. next week). After we reach 250 GDD base 50 after biofix, codling moth control should begin to target larvae.

Over the warm Memorial Day weekend, sweet cherries sized rapidly and plum curculio were on the move and laying eggs. Although conditions have been cooler lately, plum curculio activity is ongoing and egg-laying scars are apparent in tart cherries, sweet cherries, and apples at the station. We have also received reports that plum curculio damage is noticeable in some cherry orchards. We remind growers that pyrethroid insecticides generally provide shorter residual activity compared with other insecticide classes. Lastly, growers considering premix insecticides should ensure that the amount of active ingredient in the premix is sufficient for effective control of the target pest(s).

This is the second week of San Jose scale male activity, and we found a sizable increase in the number of males in traps at the station (Table 1) and in our commercial monitoring site. Scale numbers in traps were in the single digits last week and some traps caught more than 70 males this week. The next opportunity to take action against scale will be when crawlers emerge. Crawler emergence typically occurs ~14 days after male flight begins, 500 GDD base 51 (estimated for 11 June); this timing also often coincides with bloom of the catalpa tree.

We set pheromone traps to monitor for obliquebanded leafroller moths in apples and cherries at the station this week. We have observed a few relatively large larvae and anticipate the first generation of moths to begin flight soon. Biofix for obliquebanded leafroller is the first date of sustained catch, and biofix is used to estimate when management tactics should be used to target summer generation larvae.

Baited yellow sticky traps to monitor for cherry fruit fly were also deployed this week. Cherry fruit fly traps should be placed high in the tree canopy and on outer branches (i.e. not the interior of the canopy). Previous research suggests that trap visibility plays a key role in improving trap catches of fruit flies. Cherry fruit fly populations have been low in recent years as spotted wing drosophila management has likely impacted cherry fruit fly detections. We have not detected spotted wing drosophila in northwest Michigan at this time.

We have not observed cherry leaf spot lesions in treated orchards at this time. Following a relatively long wetting period and with cooler temperatures in the forecast, some growers may be considering using Syllit + Captan for cherry leaf spot. While this is an excellent combination for cherry leaf spot, this mix will not be effective for powdery mildew. Previous research has shown that targeting powdery mildew at first cover with an effective chemistry can provide effective seasonal control of mildew. Hence, some growers may be opting to for a Gem + Captan or Flint Extra + Captan for this next round of cherry leaf spot and mildew management; including Captan in this strategy is critically important for resistance management purposes as the active ingredient in Gem/ Flint Extra (trifloxystrobin) is a single-site fungicide with high risk for resistance development. Flint Extra became available in 2018 and the product Gem will be phased out after 2018. First cover timing is also a good opportunity to use an SDHI chemistry to target these diseases; Captan should be included with applications of an SDHI for resistance management purposes.

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

Cherry Pests	**14-May**	**21-May**	**28-May**	**4-June**
American Plum Borer (APB)	Set	5	6	7
Lesser Peachtree Borer (LPTB)		Set	4	11
Greater Peachtree Borer (GPTB)			Set	1.3
San Jose Scale in sweet cherry (SJS)	Set	0	6	73
Obliquebanded Leafroller (OBLR)				Set

Cherry Fruit Fly (CFF)				Set

Apple Pests	**14-May**	**21-May**	**28-May**	**4-June**
Oriental Fruit Moth (OFM)	0	0	0	0
Spotted Tentiform Leafminer (STLM)	12.5	18	31.5	25
Codling Moth (CM)	Set	0	0.5	7.5
San Jose Scale (SJS)	Set	0	5.5	24
Obliquebanded Leafroller (OBLR)				Set

Articles featured in past FruitNet Reports

Apogee Application Time

Nikki Rothwell, NWMHRC
Phil Schwallier, MSUE

Apogee® is a plant growth regulator composed of prohexadione-calcium that can be used in apples with significant advantages to the grower. Prohexidione-calcium reduces terminal growth by inhibiting important enzymes that help form growth-specific gibberellins. In laymen's terms, Apogee helps control tree vigor. Controlling vigor can reduce the amount/intensity of pruning, decrease internal shading--a major proponent to properly color apples, and reduce canopy density for thorough pesticide coverage. This product has also been a reliable tool for minimizing impacts of shoot blight caused by the fire blight pathogen, *Erwinia amylovora*. Shoots that have less growth are not as susceptible to fire blight, and Dr. George Sundin's work has shown that Apogee greatly reduces the potential for shoot blight. When applying Apogee to apples, growers should consider the following: timing, rate per acre, and compatibility with other chemistries in the tank.

Timing

Apogee should be applied when vegetative shoot growth is less than three inches. To best time the application, there is a 7 to 10-day window beginning at king bloom petal fall. In recent years, we are recommending that growers apply slightly earlier than petal fall as most growers miss that king bloom petal fall timing and if there is more than three inches of growth, Apogee will not work as well. Growers should try and time these applications for less than 3" of shoot growth, which in many years coincides with king bloom petal fall. This timing applies to most varieties in most years. Two more applications should be made at two-week intervals following the bloom application.

Sometimes a fourth application is needed when excessive rainfall or light crops increase vegetative growth.

Rate

The rate per acre is usually calculated on a tree row volume basis and can be adjusted to two-thirds of the full-rate. This suggested two-thirds rate per acre is a season-long rate. For example, if trees are at 75% tree row volume, then 24 ounces per acre is the seasonal rate (48 * 0.75 * 2/3). Best results are achieved when the seasonal rate is split into three or four sprays. For example, Apogee applications should be applied at 8 + 8 + 8oz per acre for a total of 24oz per acre per season. When the fire blight risk is high, the first application of Apogee at or prior to king bloom petal fall timing should be increased to as much as 150 percent of the split rate. For example, the rate should be increased from 8oz per acre to 12oz per acre. If the first spray rate is increased, subsequent sprays (second and third sprays) should be reduced. The seasonal application would be 12 + 6 + 6 = 24 ounces per season instead of 8+8+8=24oz. If temperatures continue to remain high with the potential of rainfall for many days this coming week, a higher rate of Apogee is recommended as the EIP for fire blight is high at all sites across NW Michigan.

Compatibility

Apogee is not compatible with calcium or boron in the tank. We also recommend that Apogee be applied after the thinner application. If the two-week timing interval is also the ideal time to thin, make the thinning application first and follow with Apogee a few days later. Growers should read the Apogee label carefully. Apogee must be used with an organosilicone surfactant, and an equal weight of spray grade ammonium sulfate should be applied. Do not use Apogee on 'Empire,' 'Stayman,' or 'Winesap' because of the potential for fruit cracking.

To conclude, Apogee is an excellent tool to help control vegetative growth, which decreases the need for summer pruning and can suppress the spread of fire blight among shoots and within shoots. The above recommendations are the best way to maximize the use of Apogee.

Understanding Thinning and the Carbohydrate Model

Fruitlets need energy to grow, survive, and set. The carbohydrate model predicts the grams of carbon/tree unit that are available to the tree for fruitlets and vegetative growth. A deficit of energy (carbohydrates) causes stress in the tree. When apple trees are under stress they are more sensitive to naturally drop fruitlets. In the same sense, stressed trees also respond more to chemical thinning applications. We have been using the carbohydrate model as a thinning guide for many years in Michigan with good success. The model is now on Enviroweather. Growers should click on the Apple Section of Enviroweather and go to the Apple Carbohydrate Thinning tab. The user will be

directed to the Cornell site that houses the model (http://newa.cornell.edu/index.php?page=apple-thin). Growers should select Michigan and the Enviroweather station closest to them, then click continue. Next, enter the green tip and bloom dates and click on 'calculate.' The results will be presented in chart and graph form and will provide thinning recommendations. We have also included Phil Schwallier's 2018 thinning recommendations in this FruitNet.

At the time of thinning, which with precision thinning can begin as soon as bloom, we like to see 2-3 days in a row that have stress to optimize thinner applications. A single day of deficit is not important as the trees can probably buffer that deficit. We need 2 or 3 days of deficits of carbohydrates to obtain the stress effects, and thinners will work when we have a deficit of carbohydrates, which is -10 to -40g carbon/day. The more of a deficit in carbohydrates, the more thinning activity growers will obtain from their thinning applications. A surplus of energy (carbohydrates) will strengthen fruitlets, and they will resist thinning. Traditionally, our region has hard-to-thin situations in most years because we have cold, sunny conditions, which creates a surplus of energy, and the trees resist thinning.

The Honeycrisp is at full bloom at the NWMHRC today, 25 May. If we were to apply thinner now, we have a -30 level of stress, and we would have moderate thinning. However, bloom time is not the optimum time for thinning apples. If we were at a more sensitive thinning window, 8-10mm fruit, thinners should work well during this time but because the trees are in a deficit, the thinners will probably work too well and we would recommend reducing the rates of the thinners by 15% according to the model. Since we are at bloom, the thinners will have a mild affect on thinning fruit (see bottom chart for a guide to thinning at different times in apple tree phenology), but many growers are starting to take advantage of the 'nibble' approach to thinning and are starting their thinning programs earlier than in the past. Starting to thin at bloom or petal fall increases both fruit size and return bloom.

Apple Carbohydrate Thinning Model Results

Date	Max Temp (°F)	Min Temp (°F)	Solar Rad (MJ/m2)	Tree Carbohydrate Status (g/day)				Thinning Recommendation
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5/9	73	47	7.5	0.00	25.00	-25.00	-10.3	-
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5/11	50	34	13.0	4.77	8.33	-3.56	-10.55	-
5/12	62	40	24.2	8.73	16.22	-7.49	-12.47	-
5/13	67	44	26.7	10.24	20.73	-10.49	-13.38	-
5/14	74	51	19.6	6.94	27.62	-20.68	-11.08	-
5/15	68	52	26.2	12.56	23.77	-11.21	-6.68	-
5/16	78	48	27.3	14.51	25.64	-11.13	-6.92	-
5/17	68	47	26.4	17.64	18.95	-1.31	-0.71	-
5/18	75	49	27.1	18.51	21.59	-3.08	-0.43	-
5/19	63	48	7.5	2.88	15.03	-12.15	2.13	-
5/20	62	39	26.1	24.60	10.93	13.68	5.28	-
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5/22	67	51	25.7	24.42	17.27	7.15	-10.73	Apply standard chemical thinner rate
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5/24	81	56	26.8	24.69	35.62	-10.94	-27.43	Decrease chemical thinner rate by 15%
5/25	82	66	18.3	12.18	51.79	-39.60	-30.75	Decrease chemical thinner rate by 15%
5/26	77	61	19.5	20.28	52.75	-32.47	-26.45	Decrease chemical thinner rate by 15%
5/27	75	57	21.1	27.64	54.37	-26.73	-25.99	Decrease chemical thinner rate by 15%
5/28	75	55	23.3	34.70	58.92	-24.22	-	-
5/29	75	54	24.3	39.65	62.05	-22.40		
5/30	79	56	24.3	39.94	70.55	-30.61		
5/31	-	-	-	-	-	-		

This model can help us understand what will happen if we have 2-3 day deficit and the different timings when thinners are applied. We need to be careful at 10 to 15mm when a deficit of -60 or lower occurs. Our choices are to back off rates or delay thinning. However, if a -80 g carbon/day occurs at petal fall and you thin, you may get the job done perfectly.

Here is a rule of thumb guide based on Phil Schwallier's work with the carbohydrate model:

If we have 3 days of stress, then the following natural drop may happen at the 10-15 mm stage:

Stress Level	Amt. of Thinning
-20	2%
-40	15%
-60	25%
-80	40%
-100	80%

Guide for time of thinning application of aggressive combinations (i.e. Sevin+NAA or Sevin+MaxCel): Thinning Percent at Different Time During Season and Stress Levels:

	0	-20	-40	-60	-80	-100
Petal Fall	0%	10%	15%	25%	35%	50%
6 mm	5%	20%	30%	40%	50%	60%
10mm	15%	30%	40%	50%	60%	80%
15 mm	15%	30%	40%	50%	60%	80%
20 mm	10%	20%	30%	40%	45%	50%
25 mm	3%	10%	15%	20%	30%	35%
30 mm	0%	0%	2%	5%	10%	15%

MaluSim Carb Model Thinning Decision Guide.

Stress Level	4 Day Ave Carb Balance	Thinning Rate Recommendation	Example for Gala
No	> 0	Increase Rate by 30%	S+M 150 ppm
Slight	-20 to 0	Use Standard Rate	S+M 100 ppm
Mild	-40 to -20	Reduce Rate by 15%	S+M 100 ppm
Moderate	-60 to -40	Reduce Rate by 30%	S+M 50 ppm
Severe	-80 to -60	Reduce Rate by 50%	S or M 150 ppm
Extreme	<-80	Do not thin, many fruits will fall off	

To conclude, this model is a tool that can help guide thinning strategies and thinner applications. Based on the upcoming forecasts, the weather looks like it will be excellent for thinning with the warm temperatures. We encourage growers to be diligent about thinning this season as the Michigan apple crop looks sizable and there is an abundance of bloom on apple trees this year.

PGR's and Thinning Strategies 2018

Phil Schwallier and Amy Irish-Brown, MSU Extension

Here is a link to the article:

https://www.dropbox.com/s/b6piqdomcj36glr/PGR%27s%20and%20Thinning%20Strategies%202018.pdf?dl=0

Farmer Field Day - SOIL, STEWARDSHIP & FARM LONGEVITY

Learn About:
Soil Fertility, Nutrient Utilization, and Conservation Tools

Qualifies for a MAEAP phase 1 credit

Date: June 22, 2018

Time: 8:45AM - 4PM

Location: MAPLE BAY FARM **10875 US-31, Williamsburg MI**

Reception & bluegrass performance to follow featuring **CARTER CREEK**

FREE OF CHARGE

A locally-sourced lunch is included with pre-registration

TO REGISTER:
Contact the *Grand Traverse Conservation District* via phone or email: **231.941.0960 ext. 22** // **lfreed@gtcd.org**

https://www.eventbrite.com/e/farmer-field-day-tickets-45485784205?aff=eac2

2018 IPM Update Schedule

Please join us for 2018 season Tree Fruit IPM Updates beginning the second week of May. These meetings highlight timely discussions of pest challenges and management options dictated by weather and pest biology. Attendees are encouraged to bring examples of pests and damage found on the farm to these workshops for identification and discussion. Additionally, we will host invited speakers from local organizations and MSU at this year's meetings. Workshops will be held weekly in Leelanau, Grand Traverse, Antrim, and Benzie counties. Tree fruit growers and consultants are welcome to attend meetings at any of the locations and times that are most convenient (see below). These workshops are free and do not require registration. Restricted use pesticide applicator recertification credits (2 credits per meeting) and Certified Crop Advisor credits will be available. We are looking forward to seeing you in a few weeks! For more information, please contact Emily Pochubay (pochubay@msu.edu), 231-946-1510.

Leelanau County

Location: Jim and Jan Bardenhagen, 7881 Pertner Road, Suttons Bay
Dates: May 8, 15, 22, 29; June 5, 12, 19, 26
Time: 12PM – 2PM

Grand Traverse County

Location: Wunsch Farms, Phelps Road Packing Shed, Old Mission
Dates: May 8, 15, 22, 29; June 5, 12, 19, 26
Time: 3PM – 5PM

Antrim County

Location: Jack White Farms, 10877 US-31, Williamsburg (south of Elk Rapids on the southeast side of US-31)
Dates: May 9, 16, 23, 30; June 6, 13, 20, 27
Time: 10AM – 12PM

Benzie County

Location: Blaine Christian Church, 7018 Putney Rd, Arcadia, MI 49613
Dates: May 9, 16, 23, 30; June 6, 13, 20, 27
Time: 2PM – 4PM

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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