

Northern Michigan FruitNet 2016

Northwest Michigan Horticultural Research Center

Weekly Update

FruitNet Report – May 31, 2016

CALENDAR OF EVENTS

6/10	IFTA Young Grower Scholarships Due
5/3 – 6/28	Leelanau County IPM Updates, 12PM – 2PM Jim and Jan Bardenhagen's Farm (details below)
5/3 – 6/28	Grand Traverse County IPM Updates, 3PM – 5PM Wunsch Farms (details below)
5/4 – 6/29	Antrim County IPM Updates, 10AM – 12PM Jack White Farms (details below)
5/4 – 6/29	Benzie County IPM Updates, 2PM – 4PM Blaine Christian Church (details below)

What's New?

- **Using Gibberellic Acid to Manage Crop Load in Cherry – May 31, 2016**
- **Northwest Michigan Fruit Regional Report – May 31, 2016**
- **Timing Trunk Sprays for the Borer Complex in Cherries**
- **Scouting for plum curculio is essential if growers use the plum curculio model to assist with management decisions in tart cherries**
- **Young Professional Application for Educational Scholarship to attend the 2016 IFTA Educational Events (conferences and/or study tours)**

Northwest Michigan Fruit Regional Report – May 31, 2016

Fruit are developing quickly and growers are actively managing for pests and diseases this week.

Emily Pochubay and Nikki Rothwell

GROWING DEGREE DAY ACCUMULATIONS AS OF May 30, 2016 AT THE NWMHRC

Year	2016	2015	2014	2013	2012	2011	26 Yr. Avg.
GDD42	651	634	485	577	955	503	617.5
GDD50	342	333	280	324	531	234	312.7

Weather Report

Summer-like weather was predominant over the holiday weekend. Daytime temperatures reached up into the high 70s and low 80s with nighttime temperatures in the low 50s. Humidity levels were relatively low, and we had windy conditions throughout the weekend. We have accumulated 664GDD base 42 and 357GDD base 50. We also had some much-needed rainfall on Thursday and Friday (26 and 27 May), and the Enviroweather station at the NWMHRC reported 0.22" of rain on 26 May and 0.93" on 27 May. Conditions were extremely dry across the region prior to this last rainfall. Weather forecasts have been variable, and the rainfall predictions have been considerably different depending on the different forecasts.

Crop Report

Tart cherries are coming out of the shuck, and sweet cherries are really starting to size with the recent heat and rainfall. We also have good growth on all tree fruits across the region. There are still apples in bloom on later-blooming varieties. Growers were diligent about covering up for fire blight with the warm weather and the varying predictions of rainfall. Growers have begun to thin apples, and many growers began the thinning process at petal fall. We are approaching the key thinning window as the fruit is sizing, and the weather forecasts are predicting cooler temperatures in the coming

days, which will make thinning more difficult. The most recent carbohydrate model (Figure 1) shows that we are entering a period of little stress, and we recommend that growers increase their rates of thinners to obtain the desired results. We recommend to increase the rates by 30% when the carbohydrate model shows the four-day average of the carbohydrate balance to be > 0 (which it shows below).

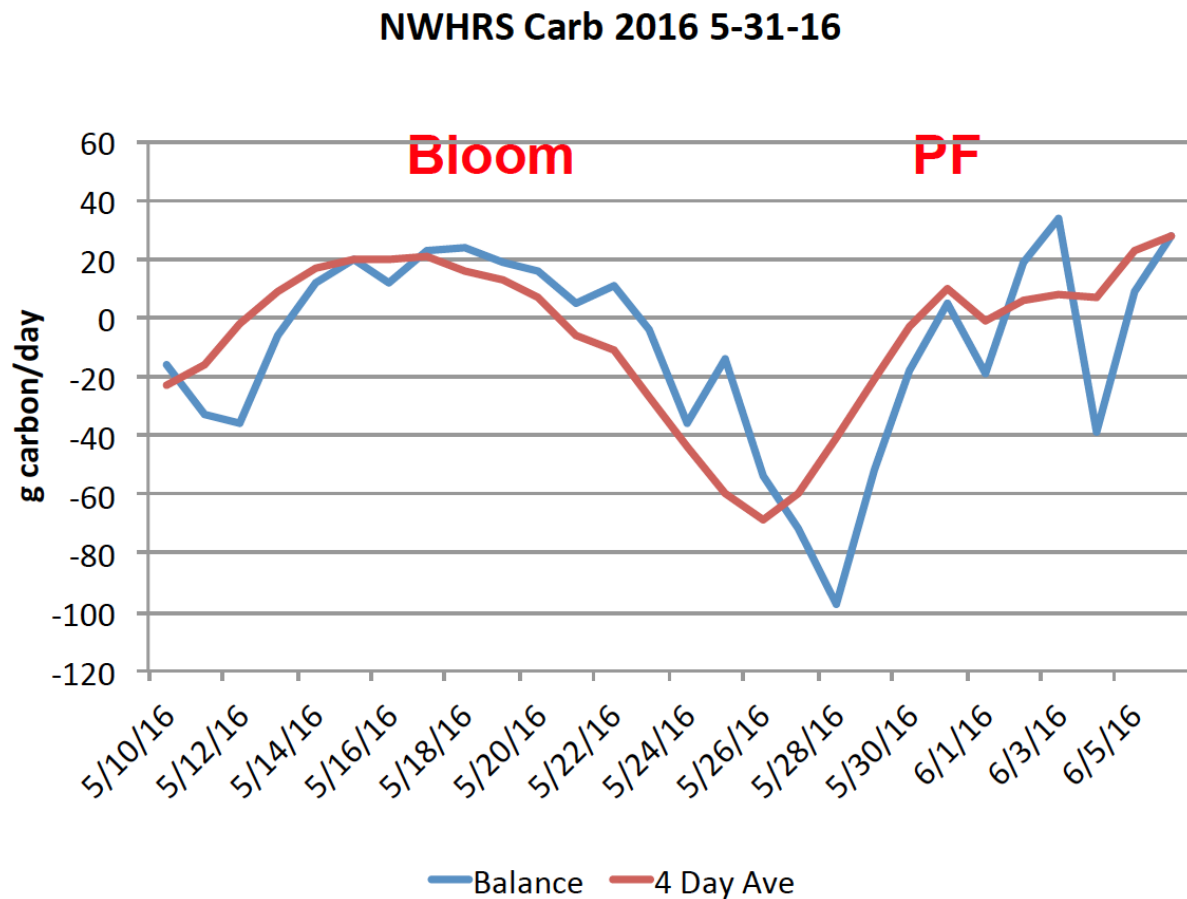


Figure 1. Carbohydrate model for the NW Station for May 31, 2016.

Pest Report

Last week was wetter and more humid compared to the season's previous dry conditions; we have also had some mornings with foggy and heavy dew. These conditions have been favorable for disease development. Most growers were well-prepared and covered for the rains that came in on Thursday and continued through the weekend in some areas. The NWMHRC received 1"+ of rain on Thursday and Friday evenings; some areas were wetter and others were drier over the weekend. Most

orchards will need reapplication of spray materials before the next rain comes, which is predicted for Tuesday, 1 June.

Some orchards are past bloom, and fire blight blossom blight is not a concern in these orchards. However, hail was reported on Thursday afternoon in northern Leelanau County, and trauma blight was a concern in areas that received hail. EIP levels remain high for the early part of this week, but temperatures are predicted to cool down and fire blight development will slow down in cooler conditions. Growers should keep all open blossoms and tag bloom covered for fire blight if conditions continue to be favorable.

Primary apple scab is ongoing and spores discharged during Thursday and Friday rain. Between one and three infection periods were reported in varying locations throughout the northwest in the last week;

East Leland reported three infection periods. Primary apple scab is ongoing with ~100% spore maturity and ~84% discharge at the NWMHRC where our biofix is April 17th. Primary scab season typically ends when 100% of spores have discharged according to the Enviro-weather model. We have observed a dramatic decrease in the number of spores discharged during recent rain, and we will continue to monitor for spore release to determine the end of primary.

Table 1. Apple scab spore discharge

Date	Time			Avg #
Collected	Collected	Rod 1	Rod 2	Spores
4/21/16	1:30 PM	NA	10	10
4/25/16	9:30 AM	37	50	43.5
4/26/16	8:15 AM	9	4	6.5
5/1/16	1:30 PM	0	0	0
5/5/16	8:00 AM	44	77	60.5
5/12/16	3:00 PM	78	5	41.5
5/14/16	12:00 PM	136	112	124
5/16/16	2:00 PM	0	0	0
5/26/16	8:00 AM	46	22	34
5/28/16	10:30 AM	15	9	12

Like apple scab, cherry leaf spot infections were also triggered throughout the region following recent wet weather. Depending on location, one to four leaf spot infection periods occurred in the last week. Eastport reported four; Bear Lake, East Leland, Northport, and Old Mission reported three; NWMHRC, Elk rapids, and Kewadin reported two; Benzonia reported one infection period. The severity of these infection periods was variable among the locations due to varying weather conditions. Cherry leaf spot lesions are appearing at the station and we have received reports of leaf spot in the area. Cherries are out of the shuck in many orchards and growers are planning first cover sprays for leaf spot and powdery mildew.

Plum curculio adults are active throughout the region and we have observed oviposition scars in many tree fruits (apricots, apples, sweet and tart cherries). Exposed fruits coming out off the shuck and developing apples should be protected from plum curculio feeding and oviposition as soon as possible.

Codling moths are flying, and we have received reports of high catches in some isolated areas in Leelanau and Manistee Counties. The first codling moth was found at the station on 26 May 2016, and we have received reports of earlier catches in the area. Some growers in hot spot areas set biofix last week. Once biofix is set, growing degree-day accumulation should be monitored to determine when to manage for codling moth eggs and larvae. Codling moth egg laying has begun or will begin this week in orchards that set biofix last week. A cumulative catch of five or more codling moth per trap during the first generation may indicate the need for management; management of codling moth eggs typically occurs between ~100-250 GDD base 50 degrees F after biofix.

Other moth larvae are evident in terminals at this time. We have observed feeding damage, webbing, and frass from green fruit worm and various leafrollers in both apple and cherry terminals as well as on developing fruit. Green fruit worm numbers seem to be high this season.

American plum borers are at peak flight this week; we found an average of 19 American plum borer moths per trap. We also found high numbers of lesser peachtree borers in traps this week with an average of 20 moths per trap. Trunk sprays to target these two borer species would be well-timed in early June. Greater peachtree borer activity has not been detected at this time.

Wine Grapes

Duke Elsner, MSU Extension

In the research center variety trials, most *vinifera* are at 3-6 inch shoot stage with a few at 6-10 inches. Hybrids are mostly in 6-10 inch shoot stage. All clusters are showing and the crop load looks good. The heavy rain of last week likely caused a discharge of powdery mildew spores, but the rains may have been so heavy that many spores were simply washed to the orchard floor rather than lodging on green tissues where they could infect plants. No significant pest insect activity was noted this week.

There is a “First Friday” meeting scheduled for this week—June 3, 3-5 pm at L. Mawby Vineyards in Leelanau County. Main topics will be disease scouting, weather influences and fungicide selection presented by Dr. Annemiek Schilder from MSU.

Saskatoons

Duke Elsner, MSU Extension

Local plantings are in the small green fruit stage. Activity of adult saskatoon sawfly has ended, and the numbers of apple curculio also are lower than last week. An unsprayed block of plants at the research center have lots of fruit injury from sawfly and apple curculio; some larger egg laying scars may have been the work of plum curculio, but

none of these insects were seen in sampling. The same site also has a good number of larval green fruitworms feeding on foliage and foliar aphids in small numbers.

I have not yet seen symptoms of entomosporium leafspot or rust diseases, but they are likely to appear soon. These will be serious threats for the next few weeks if we get into periods of rainy weather.

A saskatoon field day has been scheduled for morning of June 17; participant. will visit saskatoon production sites in Leelanau and Grand Traverse Counties. For the full agenda or more information, contact me at elssner@msu.edu.

Using Gibberellic Acid to Manage Crop Load in Cherry – May 31, 2016

To help manage crop load in cherries, growers should apply Pro-Gibb to cherries when terminals have 5-7 leaves.

Gibberellic acid (GA) is a plant hormone that promotes growth and elongation of cells. In tart and sweet cherries, GA has been used successfully to reduce flowering during the early years of an orchard's life. The reduced flowering and subsequent reduced fruiting helps young trees increase vegetative growth. Minimizing flowering in early years slows the transmission of pollen-borne viruses in young trees. Furthermore, preventing fruit development on non-bearing trees could help to reduce localized population build up of spotted wing drosophila and other direct pests of cherry fruit. We have also shown that GA used in mature tart cherry orchards can increase fruiting capacity by stimulating the formation of lateral shoots and spurs.

When GA is applied to cherry trees in late spring, a percentage of the flower buds forming for the following season will be converted to vegetative buds. Therefore, GA application in 2016 influences flowering in 2017. The effectiveness of GA is dependent on rate, timing and temperature. Surfactants have also been shown to influence GA applications. As a rule of thumb, high GA rates are required to prevent young trees from fruiting, whereas much lower rates are used to keep bearing trees in a good balance between vegetative and fruit production. GA applications should be made when daily high temperatures are expected to be above 70° F for two to three days, if possible. We have observed poor results when applications are made when daily high temperatures are below 60° F as is the case with most growth regulators. We hypothesize that last season's temperatures may have been too cool when GA was applied for a good response from the application. As a result, some young trees have a lot of flowers on them when growers were trying to use GA to minimize flowers and

fruit on the trees. In this situation, growers should really try to optimize GA use when temperatures are warm this spring to reduce the crop load for 2017.

If orchards have 5-7 fully expanded leaves, we suggest that growers begin GA applications this week to improve response. Currently, temperatures are predicted to be in the 70s for the remainder of the week with the chance for a temperature drop into the 60s early next week. GA will be less effective in cooler temperatures, so growers should try and make GA applications when temperatures are warm, particularly if they had lack of response in young blocks that were the result of the cool temperatures last spring.

Non-bearing trees

GA is typically applied to non-bearing cherries with a handgun, so rates are applied on a dilute basis. The best results are generally achieved with two applications of 50 ppm (20 fl. oz. of 4% formulated product per 100 gallons of water). The first application should occur 3 to 3 ½ weeks after full bloom, followed by a second application 2 ½ to 3 weeks later. An alternative method, though slightly less effective, is to apply a single treatment of 100 ppm (40 fl. oz. per 100) at about 3 to 4 weeks after bloom. GA should not be applied to trees during the year of planting, due to possible phytotoxicity.

Vigorously growing trees in their second leaf do not need GA, as these trees naturally produce little fruit the following year. GA application often starts in year three, but may be desirable in year two if trees start off poorly. These high rates should continue until the year prior to first harvest/year of production.

Early bearing trees

To bring young cherries into bearing following GA treatments with high rates, growers should phase down GA rates rather than discontinuing GA use all at once. A sudden drop of GA from high rates to nothing will result in oversetting of fruit and potential tree stunting. Trees that have been kept vegetative with GA use have a tremendous capacity to set (overset) fruit. The year prior to when growers first desire fruiting, they should apply GA at 30 to 40 ppm if spraying dilute (12-16 fl. oz./100 gal.) or 20-24 fl. oz./acre if applied at a concentrated rate. This rate per acre for concentrate spraying takes average tree size into account; therefore, growers should not reduce the rate further based on tree row volume. The next year, decrease this rate to 15 to 20 ppm applied dilute (6-8 fl. oz./100 gal.) or 10-12 fl. oz./acre concentrate. The following year, 10 ppm is optional but often not required. In orchards where growth is weak, growers should continue annual GA applications at 10-15 ppm as described for bearing trees.

Bearing trees

Growers should apply GA 3 to 4 weeks after bloom or when trees have 5 to 7 leaves (3 to 5 fully expanded) on terminal growth. GA should be used at rates of 10 to 20 ppm or

4 to 8 oz/100 gallons of ProGibb 4% (or equivalent) when applied dilute. For concentrate application to full-sized tart cherries, use 6 oz/acre of product to achieve a 10 ppm response or 12 oz/a for a 20 ppm response. Lower rates are typically used on more vigorous orchards or those with previous successful use of GA. Adding surfactants has caused varied responses—everything from increased phytotoxicity to no GA-related effects. Therefore, adding a surfactant is not suggested unless a grower has enough experience with a product to have confidence in the response.

GA Use on Balaton

Balaton appears to have less need for GA during non-bearing years to maintain good tree growth, but as it matures, the variety produces a lot of blind wood. Therefore, using GA is strongly encouraged on bearing Balaton trees. Figure 1 shows the successful use of GA to increase lateral shoots and spurs in a Balaton orchard at the NWMHRC. However, we cannot conclude that GA applications improve Balaton yields although GA does appear to increase crop load based on a trial conducted at the NWMHRC (Figure 2).

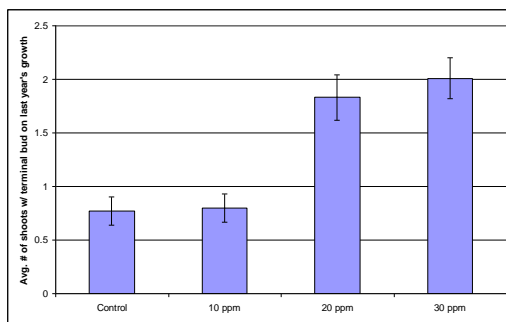


Figure 1. Average number of shoots with terminal buds in a Balaton orchard.

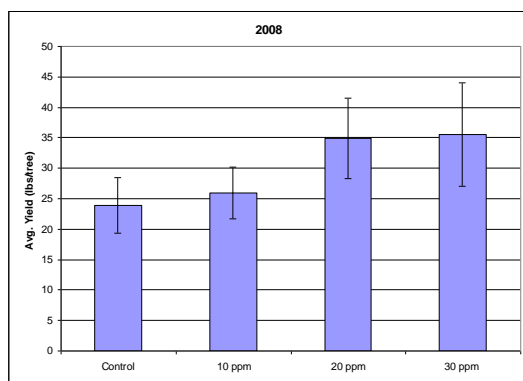


Figure 2. Average Balaton yield with different rates of GA.

Timing Trunk Sprays for the Borer Complex in Cherries

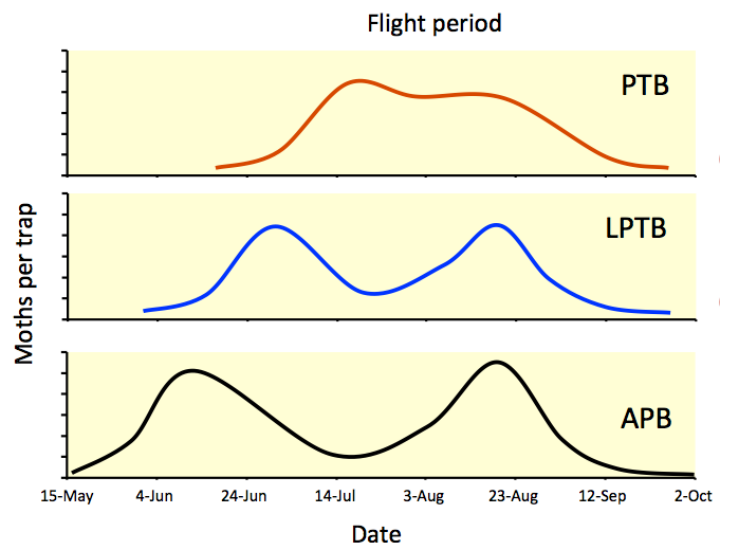
Trunk sprays in early June will be well-timed for American plum and lesser peachtree borers.

E. Pochubay and N. Rothwell, MSU Extension

The complex of borer pests in cherries is comprised of three species: the American plum borer (APB), lesser peachtree borer (LPTB), and greater peachtree borer (GPTB). All three species are moths in their adult stage, and the larvae are borers that feed under tree bark. These larvae, or borers, feed on cambium tissue, which can girdle the tree and cause tree decline or death. While these borers also attack other tree fruits including apple (APB), peach, pear, plum, and nectarine, the mechanization trunk shaking cherries is linked with increased APB and LPTB infestation in cherry orchards. Mechanical harvesting can cause damage to tree trunks, and over multiple seasons, the cambium tissue that is exposed when a tree is damaged is a more attractive egg-laying site for APB and LPTB. LPTB are also capable of causing tree mortality if populations reach damaging levels, but often APB causes more damage than either LPTB or GPTB as there are usually more APB larvae per wound and APB feeds horizontally, which girdles the trees more effectively than feeding in both horizontally and vertically. GPTB are unique as females do not need a damaged site to lay eggs, and these larvae feed on the cambium at or up to 6" below the soil line, which renders PTB damage difficult to diagnose if it is underground.

APB is the first of these borer species to begin flying in the spring around the popcorn stage in tart cherry, followed by LPTB near petal fall, and GPTB after shuck-split. After emergence, adults mate, and females find sites to lay eggs such as in the crevices of injured bark or in the case of GPTB, most eggs are laid at the base of trees. Females lay eggs singly or in clusters and larvae of each species can be found in groups on a tree. While APB larvae primarily feed on cambium tissue up to 2-3 ft on the trunk from the soil, LPTB larvae can be found feeding on cambium tissue on any part of a tree that has been injured. Unlike, APB and LPTB, GPTB larvae will bore into tree bark and attack healthy, undamaged trees. GPTB typically feed on the lower portion of trunks from a few inches above to a few inches below the soil and will also feed on roots. There is only one generation of LPTB and GPTB per season, and a second generation of APB emerges around cherry harvest through early fall. All three species overwinter as larvae; APB larvae pass the winter in a silken cocoon called a hibernaculum. In the spring, these larvae will resume feeding and the cycle begins again.

Although their life cycles are similar, the emergence patterns of these borers are



staggered and make timing management strategies difficult. Currently, the most reliable control tactic is a trunk spray of chlorpyrifos (ex. Lorsban). This trunk spray primarily targets young larvae that hatch and begin feeding in the spring and can be timed to control multiple borer species. Growers should monitor for adult activity using pheromone baited delta traps, and the insecticide application should be made when multiple adult borer species are active. A well-timed trunk spray is key for optimizing the value of the spray as well as management of borer larvae. Furthermore, taking special care to spray the base of the trunk will help with GPTB control. **Note:** Lorsban has phytotoxic effects on sweet cherry and will cause foliar and fruit injury. In cherries, do not apply Lorsban as a trunk spray within 21 days before harvest; be sure to check pesticide labels for rates and additional use requirements.

Scouting for plum curculio is essential if growers use the plum curculio model to assist with management decisions in tart cherries

Plum curculio are active in NW MI and we have observed oviposition in several tree fruits at this time.

Emily Pochubay and Nikki Rothwell

Weather in northwest Michigan has been steadily warm with variable moisture, and these conditions have been conducive for insect development and movement into orchards. Daytime and evening temperatures above 60 degrees Fahrenheit and moisture increase plum curculio (PC) activity. We have observed PC feeding damage and oviposition scars in apricots, sweet and tart cherries, and apples, and many growers are applying an insecticide to manage this pest.

Some growers and consultants use the PC model on Enviro-weather to assist with timing PC sprays. This model was developed as a postponed insecticide treatment strategy for PC, and scouting is critical for using this model effectively. Because conditions have been ideal for PC activity, and most tree fruits are at a susceptible stage for PC egg laying, growers and consultants should be actively scouting for PC. We recommend that scouting be used in conjunction with the model rather than solely relying on the model to make management decisions. This model assumes that an intensive scouting program be used along with growing degree day accumulations, and orchards with a relatively higher PC population, hot spot blocks adjacent to woodlots, may need management sooner than the model suggests.

The PC model is specifically for use in tart cherry as it is based on tart cherry development and predicted emergence of PC. At late bloom/petal fall timing, growers and consultants should begin scouting for PC, particularly with temperatures above 60 degrees with rain and/or high humidity. Scouting should continue to determine actual PC presence and density, and the model can be used as a reference for management. To use the model, locate the date of full bloom to establish a biofix. This season, the NWMHRC biofix was 5/17. Follow the corresponding column downward to determine the growing degree-day accumulations as well as the predicted accumulations according to the forecasted temperatures. Currently, the model shows that the NWMHRC has accumulated 221 GDD base 50 F. According to the model, management is recommended 375 GDD base 50. All PC eggs that have been laid prior to 350 GDD will hatch into larvae, and these fruits will drop from the tree and will not be present at harvest time. If we were to rely solely on the model, PC management at the NWMHRC would not occur until sometime after June 6th. However, we actively scout for PC, and we have already observed PC oviposition in tart cherries, and as a result, we are applying insecticides for PC management at this time.

Knowing the history of an orchard's PC pressure, monitoring weather conditions, and conducting an intensive scouting program are all key factors that influence management decisions. By monitoring these factors, growers and consultants can use the Enviro-weather model to delay or postpone PC management until 375 GDD base 50 after biofix.

Young Professional Application for Educational Scholarship to attend the 2016 IFTA Educational Events (conferences and/or study tours)

Scholarship is open to members in any country. The application can be found at:

<http://www.ifruittree.org/Portals/46/2016%20Study%20Tour/2016YoungProfessionalScholarshipApplication%20form.pdf?ver=2016-05-25-175833-450>

2016 Study Tour Info

Make plans now to attend the IFTA New York State Study Tour, July 19-21. Plan to fly into Rochester on Monday, July 18, as the tour will start bright and early on Tuesday, July 19 (hotel Monday night is included in the registration cost).

The first day of tours will be throughout Orleans County and will cover a variety of topics from tall spindle systems, to pruning, to fireblight management, and even a discussion on hard cider.

The second day will be a full day at the Cornell Fruit Field Day hosted at the Cornell Agricultural Research Station.

The final day of tours will be in and around Geneva, and topics will include employee training, grafting, wild bees, and orchard equipment just to name a few.

This tour will be packed full of practical tools and ideas to take back to your business. Space is limited and is expected to sell out, [click here to register today!](#)

Young Professionals - apply for a scholarship from IFTA to help defray the cost of attending the 2016 Study Tour. Applications are due June 10!

Your orchard/organization must be a 2016 IFTA member to register for the Study Tour.

Application deadline for New York Study Tour is June 10, 2016

Food Security Program

The League of Women Voters Leelanau County will host a forum entitled “**Food Security**” on Wednesday, June 1, 2016 at noon in the lower level of the Government Center in Suttons Bay. The forum will explore the impacts of a changing climate on sustainable food security and mitigations and adaptive strategies to address these changes. The panelists include Dave Barrons, former TV weather reporter and climate change activist; Richard Allen, Leland yard farmer and gardener; Kelly Lively, Policy and Outreach Partner at Cherry Capital Foods; Jim Nugent, former head of MSU Horticultural Center and local fruit farmer; and Jim Schwantes of Sweeter Song CSA and contributor to local farmers’ markets. Before the forum at 11:15 AM there will be a meet and greet with local and regional food-related organizations and businesses who will provide opportunities to learn new skills and information on what an average person can do.

Many people bring a sack lunch. LWVLC business meeting to follow presentation. For more information: Call [231-271-5600](tel:231-271-5600), visit LWVLeelanau.org or follow LWVLC on Facebook at [League of Women Voters Leelanau County](#)

2016 IPM Update Schedule

Emily Pochubay and Nikki Rothwell
Michigan State University Extension

Tree Fruit IPM Updates beginning the first week of May through mid-July (as needed) will highlight management of the seasons current potential pest challenges 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. Workshops will be held weekly in Leelanau and Grand Traverse counties and bi-weekly in Antrim and Benzie counties in May. Beginning in mid-June, we will hold weekly meetings in all four locations. Tree fruit growers 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. 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 3, 10, 17, 24, 31; June 7, 14, 21, 28

Time: 12PM – 2PM

Grand Traverse County

Location: Wunsch Farms, Phelps Road Packing Shed, Old Mission

Dates: May 3, 10, 17, 24, 31; June 7, 14, 21, 28

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 4, 18; June 1, 15, 22, 29

Time: 10AM – 12PM

Benzie County

Location: Blaine Christian Church, 7018 Putney Rd, Arcadia, MI 49613

Dates: May 4, 18; June 1, 15, 22, 29

Time: 2PM – 4PM

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WEB SITES OF INTEREST:

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://agbioresearch.msu.edu/nwmihort/faxnet.htm>

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>

Fruit CAT Alert Reports:

<http://news.msue.msu.edu>