

Northern Michigan FruitNet 2018
Northwest Michigan Horticultural Research Center

Weekly Update

FruitNet Report – May 15, 2018

CALENDAR OF EVENTS

5/8 – 6/27

IPM Updates

5/24

Thinning Meeting
NWMHRC, 11:30AM – 2:30PM

6/22

**Farmer Field Day - SOIL,
STEWARDSHIP & FARM
LONGEVITY**
(More info below)

What's new?

- **Northwest Michigan Fruit Regional Report – May 15, 2018**
 - **Thinning Meeting**
 - **Retain Use to Increase Sweet Cherry Yields**
 - **Leelanau County Health Department scheduling respirator fit tests – Updated**
-

New articles

Northwest Michigan Fruit Regional Report – May 15, 2018

Fruit trees have developed quickly in the last week and the coming week's weather is looking promising for good pollinator activity during bloom.

Emily Pochubay and Nikki Rothwell, MSU Extension

GROWING DEGREE DAY ACCUMULATIONS AS OF May 14, 2018 AT THE NWMHRC

Year	2018	2017	2016	2015	2014	2013	28 Yr. Avg.
GDD42	267.7	342.7	344.1	360.3	240.3	307.6	371.7
GDD50	126.6	138.1	142.3	163.3	90.2	163.5	168.3

2018 Growth Stages – NWMHRC May 14, 2018

Bartlett Pear – Early wht. bud
Potomac Pear – Green cluster
Mac – Tight cluster
Gala – Tight cluster
Red Delicious – Tight cluster
HoneyCrisp – Tight cluster
Montmorency – Bud burst
Balaton – Tight cluster
Hedelfingen – 80% bloom
Gold – 1st bloom
Napoleon – 80% bloom
Riesling – Early bud swell

Weather Report

Temperatures are feeling much more seasonal with daytime temperatures that started out in the mid-60s during the weekend, and hit a high of almost 77 degrees F yesterday, 14 May. The forecast for the remainder of the week looks warm—60s for a day or two then hitting the high 70s by the end of the week; conditions look seasonal over the coming weekend. There is a possible rain event on Saturday, but overall, the conditions

look sunny and warm. Pollinating conditions looks excellent for both tart and sweet cherries that are blooming throughout the region.

Although we received 0.3" of rain at the NWMHRC last Wednesday, 9 May, conditions are quite dry across northwest Michigan. Despite our early rains, soils are drying out quickly and growers are trying to get irrigation systems up and running. With the dry conditions, growers are less concerned about disease pressure.

Crop Report

With the coming dry weather, we anticipate a lot of sweet cherry pruning to be done this week. Growers have been dodging the past week's wet weather, and this window will be a great opportunity to prune sweets. Growers are still pruning other crops, and brush is being removed from the orchards. Growers were able to burn brush piles during a small window with wet weather last week, but many burn piles have yet to be burned throughout the region. Growers are also planting trees at this time. We planted at the NWMHRC yesterday, and soils were surprisingly dry even at depths of 6"+.

As mentioned above, conditions look excellent for pollinating cherries this week. Beekeepers have been delivering bees in sweet cherry orchards, and hive quality looks good. We have also seen a lot of activity from wild bee populations so far this season, particularly in cherry orchards.

If growers are not planning to harvest brine cherries this season, we have written an article on how to remove fruit (http://msue.anr.msu.edu/news/how_to_manage_brine_cherries_that_will_not_be_harvested_in_2018). However, these data are fairly preliminary, and most of our research has been conducted in tart cherry. We hypothesize that ethephon used at full bloom will also remove sweet cherries, but we have little data to support this hypothesis. Our data in tart cherry showed that 150ppm at full bloom timing removed 70% of the fruit; 150ppm is equal to 0.5 pint/100. Growers that plan to remove fruit using ethephon should consider making these applications this week as sweet cherries are at various stages of bloom throughout the region.

Lastly, we recommend ReTain applications to be made as soon as possible in shy bearing sweet cherries. Our data has shown that the sooner these applications are made, popcorn to first bloom, the better the results. When later applications of ReTain are made, 50-70% bloom, we see fruit set drop considerably. One pouch per acre has been effective in our trials.

Pest Report

Many apple growers were covered for apple scab prior to rain that came mid-week last week and those applications were well-timed; all northwest Enviroweather stations reported apple scab infection periods last week. This rainfall came in the afternoon, and afternoon showers in contrast to nighttime rains are often associated with higher spore

discharges. Historical data on the RIMpro model for 9 May reflects this phenomena with an estimated peak spore discharge that occurred around 4:00 PM. Spores will continue to mature in this week's predicted dry and warm weather. As we approach pink/bloom in apples, we remind growers that this phenological growth stage is associated with the highest spore discharge rates during primary apple scab. While the weather is currently predicted to be dry, coverage of new growth/susceptible tissue will be critical prior to the next rain event to minimize the potential for scab infections.

RIMpro-Venturia Outputs

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=bQVvk0LY
Eastport (Biofix 2 May) - www.rimpro.eu/faces/venturia.xhtml?id=nK5Jcgr
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

Degree-day predictions indicate that some apple varieties could bloom early next week in warmer regions of northwest MI. Hence, we encourage growers in these areas to be ready for fire blight management, if bloom occurs during weather conditions that favor this disease. Fire blight bacteria grow rapidly in temperatures in the 70s and 80s and wet weather washes the bacteria into floral nectaries where they can infect and cause blossom blight. Currently, the forecast is for dry days in the 70s for early next week. However, growers should continue to monitor the weather and the MaryBlyt model on Enviroweather as we approach bloom.

We have observed some apple pest activity at the station in recent warm conditions, but pests have been relatively quiet and in low numbers in most commercial orchards. Green fruitworm adults have been flying over the last couple of weeks; small green fruitworm larvae became evident last week and we have observed this pest feeding on new leaves and flower buds. We have also received reports of leafroller caterpillars, tarnish plant bugs, and aphid activity in low numbers. Spotted tentiform leafminer adults (12.5 per trap) were found in traps at the station this week.

We have had one report of black stem borer activity in the northwest region at this time. We will check these traps again this week and will report back via FruitNet. However, forsythia is blooming throughout the region, and this phenological indicator is a good rule of thumb to begin black stem borer sprays. Black stem borers were detected in more southerly regions in previous weeks in traps. Growers planning to take action against this pest are encouraged to review: *Timing your black stem borer spray on tree fruit* (http://msue.anr.msu.edu/news/timing_your_black_stem_borer_spray_on_tree_fruits) and *Managing Black Stem Borer in Michigan Tree Fruits* ([http://msue.anr.msu.edu/uploads/files/AABI/Michigan_BS Management Guide 4-12-16.pdf](http://msue.anr.msu.edu/uploads/files/AABI/Michigan_BS_B Management Guide 4-12-16.pdf)).

Scouts have been anticipating the spring flight of codling moth, and as pheromone delta traps are going into orchards, we remind scouts to place the traps into the upper third of the canopy. Previous data have show that codling moth trap efficiency is improved when placed in the upper third of the canopy.

We deployed San Jose scale pheromone traps in apples and sweet cherries at the station this week; male flight typically occurs ~190 GDD base 50 degrees Fahrenheit which coincides with predicted degree day accumulations for early next week. While taking action against male scales is not a suggested management strategy, peak male flight is used as a predictor for when to expect crawler activity; crawlers will be the next opportunity to implement management tools for San Jose scale.

In cherries, sweet cherries are blooming and tart cherries have just started to open blossoms at the station. Warm and dry weather in the forecast will be very good for pollinator activity as well as pose a lower risk of American brown rot infections. European brown rot is also not a concern in tart cherries with the current predicted warm and dry weather. Flower buds and green tissue are present on tart cherry, and cherry leaf spot will be a concern if wet weather moves into the region later this week. We are currently in the midst of an ongoing wetting event following light early morning rain. As of 9:30 AM today, some Enviroweather stations are not reporting possible infections until after bloom; growers who are concerned about the potential for cherry leaf spot infection can refer to the Eisensmith and Jones (1981) table to estimate whether an infection period may have occurred (Table 1).

Table 1. Approximate number of hours of wetting period required for conidial infection by the cherry leaf spot fungus at various air temperatures.

Temperature (F)	Wetting period (hr)
81 or warmer	28
80	21
79	18
78	16
77	14
76	12
75	11
74	9
73	8
72	7
71	7
70	6
69	6
63 - 68	5
62	6
61	6
60	7
59	7
58	8
57	9
56	10
55	11
54	12
53	14
52	15
51	17
50	19
49	20
48	23
47	25
46	28

Some growers may be considering removal of light sweet cherry trees after pollination this season due to loss of markets. If San Jose scale has been a problem on these trees that will be removed, growers should consider removing the trees from the orchard to avoid the spread of this pest to remaining trees. It is unknown how long the scale will survive on trees that have been pulled up, but we encourage growers to be proactive with tree removal to minimize the potential for San Jose scale to infest adjacent varieties. While our previous observations have indicated that there is a greater occurrence of San Jose scale in light sweet cherry varieties, this pest has also been observed in damaging numbers in dark varieties. As a reminder, San Jose scale is a pest of many tree fruits and removed trees/infested brush piles should be kept away from orchards. Lastly, growers planning to remove light varieties should review cross-pollination partners to ensure that the remaining varieties in the orchard can successfully pollinize in future seasons (https://www.canr.msu.edu/uploads/files/Research_Center/NW_Mich_Hort/Training_Pruning_Varieties/SwtChryPollinationChart_2013.pdf).

Thinning Meeting

A thinning meeting will be held at the NWMHRC on Thursday, 24 May, 2018. Phil Schwallier will be on hand to talk about thinning strategies for the season. Thinning has begun earlier in the season, and many growers are starting their programs at bloom time. Phil will also discuss the carbohydrate model and a new thinning model on the RIMPro website.

The meeting will kick off with lunch at 11:30. The educational portion of the meeting will run from 12:30-2:30. We would like to thank CPS for sponsoring lunch at this meeting. Please RSVP for lunch by calling Jenn at the NWMHRC: 231-936-1510 or emailing goodr100@msu.edu

Retain Use to Increase Sweet Cherry Yields

N.L. Rothwell and E. A. Pochubay, NWMHRC

Many growers use ReTain in sweet cherry blocks to increase fruit set and ultimately increase their yields. ReTain is a plant growth regulator that has been shown to extend flower viability in cherry by reducing ethylene production in cherry flowers and delaying flower and stigmatic senescence. Due to this effect, flowers that last longer have a higher likelihood to be successfully pollinated, and increased pollination results in a higher yield. Research has shown that ReTain works best if used before poor pollinating

conditions (wet, cool, windy weather or low honeybee activity) or on varieties that tend to be shy-bearing.

Sweet cherries are currently at 10% to 80% to full bloom at the NMWHRC, depending on variety. Data have shown that ReTain applications are more effective when applied early and with the predicted warm temperatures ReTain applications could help improve yields this year. However, conditions are predicted to be warm and dry, which are excellent for pollination, and the addition of a ReTain application may not improve yields under these conditions compared to a year when we have cold and wet weather during bloom.

We conducted a ReTain trial at three grower farms in 2014. ReTain was applied in two Balaton blocks and one sweet cherry var. Regina block. Each block was approximately 10 acres where half of the block was treated and the other half untreated. ReTain was applied at the recommended rate of 1 pouch per acre (11.7 oz/A) at popcorn to early bloom stage at 100 gal/A. No surfactants or fungicides were tank mixed with the product. We found that ReTain significantly improved yields in the Regina orchard (Figures 1 and 2) and one of the Balaton orchards; in both of these trials, ReTain was applied at <10% bloom. In the second Balaton orchard, the ReTain application was made at 70% bloom, and the PGR had no effect on yield. Therefore, we recommend making ReTain applications early: popcorn to first bloom.

A team from Washington State University and Oregon State University has also conducted ReTain trials. ReTain was applied at four stages during bloom: popcorn, 10 percent full bloom, 50 percent full bloom, and full bloom. The ReTain treatment at 10 percent full bloom gave as much as a 20 percent increase in fruit set compared with the control. That was a gain of almost 9 pounds per tree or 2 tons per acre. Tests with Tieton also resulted in significant increases in fruit set. However, unlike the results we observed in Michigan, the western team found that each of the application timings improved fruit set, though there was no consistent trend. They concluded that there could be a broad window when the treatment can be effective. Some of the variability in results could have been attributable to the weather at the time of or immediately after application as warm temperatures would have hastened the senescence of the ovule.

Although the results varied from our trials in Michigan, we are still recommending that ReTain be sprayed early in the season, either popcorn or first bloom. The rate of ReTain is one pouch per acre (11.7oz/acre). The more tissue on the tree, the better the response, but the key timing is early based on our results and past recommendations by the Valent Company. The spray volume is recommended at 100 gal/acre. ReTain cannot be used after petal fall, and it is not recommended if rain is expected within eight hours of application. Temperature should be monitored during application timing as the effectiveness of plant growth regulators decrease at low temperatures. Also, we recommend applying ReTain under slow drying conditions. According to the Valent representatives, they have found that treating a larger block is more effective than treating rows within a block; the overall effectiveness of the active ingredient in ReTain is improved with broad coverage.



Figure 1: ReTain-treated Regina



Figure 2: Untreated R

Leelanau County Health Department scheduling respirator fit tests – Updated

The Leelanau County Health Department (LCHD) will be on hand for respirator fit tests this Thursday, May 17th at the Northwest Michigan Horticultural Research Center and again next Tuesday, May 22nd, at Jim and Jan Bardenhagen's farm after the Leelanau IPM Update.

The LCHD will be available after the May 22nd Leelanau IPM Updates at Jan and Jim Bardenhagen's farm, starting at 1:45PM. There is limited availability for the May 22, 2018 fit tests.

If you are interested in signing up to receive the fit test on May 17th or May 22nd, please contact Jenn at the research center, at goodr100@msu.edu or 231-946-1510, and she will send over paperwork to be filled out before the fit test. People will be given a time slot for tests on a first come, first serve basis. Cost is \$35 and checks will need to be made out to the Leelanau County Health Department.

Articles featured in past FruitNet Reports

How to Manage Brine Cherries that will not be Harvested in 2018

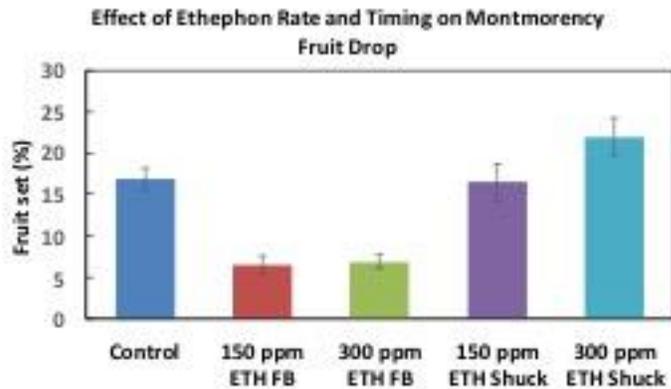
Nikki Rothwell, Todd Einhorn, and Emily Pochubay, MSU

Preliminary data suggest that ethephon may be a tool to remove unwanted sweet cherries

Some growers have been informed that their light colored sweet cherries intended for the brine market are not needed during the 2018 season. This news is certainly unfortunate, but because light sweets are often interplanted with dark sweet cherries, this situation is even more complicated. Growers that do not plan to harvest light sweets are wondering if there is a method to remove fruit from the trees—removing fruit will minimize American brown rot infections as well as spotted wing drosophila (SWD) infestations, both of which can easily spread to adjacent dark sweets.

Growers have inquired about using lime sulfur and oil (LSO) or ammonium thiosulfate fertilizer (ATS) to burn off the blossoms in the light sweets. LSO will remove blossoms by burning the stigma and pistils, and this material prevents pollen germination and fertilization. LSO additionally depresses photosynthetic activity of the tree for a few days post-application. ATS has been used in apples to remove blossoms solely as a caustic thinner. However, neither of these options is ideal as most growers are likely depending on the light sweet blossoms for pollination of the dark sweet cherries. If LSO or ATS are used to burn off the blossoms, these flowers will likely be non-viable as pollinizers for pollinating dark sweets; in many blocks of mixed sweet cherries, the dark sweets will be the economic driver. In short, we need a different method to drop lights sweet after they provide pollination services for dark sweets.

Growers have increasingly observed more fruit on non-bearing Montmorency trees despite well-timed applications of GA (Pro-Gibb). In 2017, we conducted preliminary studies to initiate fruitlet abscission on young Montmorency tart cherry trees based on previous experiments with sweet cherry trees in WA. The WA trials were intended as postbloom thinning treatments and therefore applications did not begin until shuck split. Interestingly, ethephon reduced fruit set between 70% and 90% depending on the year and cultivar in WA trials. Further, there was a clear rate response between 100 and 300 ppm with the greatest efficacy at 300 ppm. In our Montmorency trials conducted in Michigan, we evaluated application timings at full bloom or shuck split with two rates of ethephon: 150ppm and 300ppm (plus NI surfactant). These were compared to nontreated control trees (Control). Fruit set was expressed as the percent of pre-counted flowers per tree (500) with fruit after natural fruit drop.



Results from this preliminary trial showed that ethephon applications at full bloom significantly reduced fruit set compared to the Control (~a 70% reduction in fruit in treated trees from 18% fruit set in control trees to 5% with ethephon, Figure 1). The 150ppm rate was sufficient to saturate the response (i.e., no further effect was observed by doubling the rate). At these relatively low rates of ethephon, we did not observe any phytotoxicity or gummosis. However, unlike sweet cherry, applications made to tart cherries at shucksplit had no effect on fruit drop. Whether or not applications at alternative phenology stages (first white, 50% full bloom, petal fall) would improve the abscission response is the subject of additional trials currently underway at the Northwest Michigan Horticultural Research Center and the Clarksville Research Center (CRC) this spring, 2018.

In summary, there are few data that show the effectiveness of using ethephon to remove unwanted fruit in sweet cherries. However, our preliminary data in tart cherries showed that ethephon will remove ~70% of the fruit if applied at a minimum of 150ppm at the full bloom timing. Additionally, the trial at CRC showed that the ethylene response in tart cherries is rate dependent, and that the untreated trees had no ethylene activity. These results are promising as they may indicate that cherry is responsive to ethephon applications at early timings in addition to pre-harvest, and this material may be a method to remove unwanted fruit in light sweet cherry blocks/rows.

Timing your black stem borer spray on tree fruits

Guidelines for making your black stem borer treatment decision.

Posted by **Mike Haas**, and Larry Gut, Michigan State University, Department of Entomology

For more information contact haasm@anr.msu.edu

One of the insect pests targeted for management early in the tree fruit season is the black stem borer. Most growers do not have a problem with this pest, but those that do

will attest to the difficulty in preventing additional infestations within their orchard. Always look first to correcting the problem, or problems, stressing the trees and causing them to emit ethanol, which attracts the insect. Sometimes it is not a correctable situation, such as stress from a severe winter.

Determining when to spray for black stem borer can be difficult. Ideally, you would use the trapping information for the orchard you wish to protect along with the long-range weather forecast to come up with the perfect time to make your application. Fortunately, there are some guidelines to know when that time approaches. USDA researchers have determined that flight activity generally begins at 100 growing degree-days base 50 degrees Fahrenheit. A phenological indicator is full bloom on forsythia. We have met both these criteria in Michigan's southwest and Ridge regions and our network of traps are beginning to catch one to two beetles each. At peak flight activity, traps may collect between 10 to 50 or more beetles per week.

If flight appears to be increasing prior to bloom, a Lorsban application as a trunk application can provide the initial protection. Once bees are brought into the orchard, or bloom initiates, all insecticide applications should stop. After bloom, and once pollinators are no longer present, if trapping indicates beetle flight is continuing, another insecticide application should be made. A pyrethroid insecticide would be a good choice as these have been among the top performers in our chemical trials over the past several years. The best way to apply an insecticide for a trunk boring pest such as black stem borer is to make a trunk application versus a full tree airblast application.

More detailed information can be found in the guide "[Managing Black Stem Borer in Michigan Tree Fruits](#)" by Michigan State University.

FSMA Water Testing – Q and A

How often does a grower have to have water tested?

If water does not come into contact with the harvestable portion of a crop or a direct food contact surface, it does not need to be tested under FSMA PSR. Second, if water is treated with a sanitizer (pre- or postharvest), it does not need to be tested under FSMA PSR per 112.46(a)(3).

Can you explain the baseline/multiple testing?

If growers have to test their water, the number of samples is based on water source. Wells need to be tested 4 times the first year, then once every year thereafter. Surface water needs to be tested 20 times per year. We encourage growers to start testing for compliance now as it is more complicated that the old water testing--even though we have a few years until they enforce the FSMA PSR for large growers (>\$500K Gross

PRODUCE sales) until 2022. Folks need to test for generic E. coli using one of about eight approved enumerative tests. MSU Extension has been working in-state and nationally to get water labs, and particularly the secretaries that answer the phones at those labs, to have a set of questions they can ask a prospective client to get them the right test. Growers can find a lab that has been prescreened for FSMA PSR compliance [here](#).

The threshold they need to meet depends on whether the water will be used pre-harvest or postharvest. Pre-harvest water must have a profile (The last four years of data, independent of source) that has a geometric mean below 126 cfu generic E. coli and a Standard Threshold Value (a difficult thing to calculate longhand that represents 90% of the stochasticity of the complete range of samples.) of 410 cfu Generic E. coli. There are calculators online [here](#). Postharvest thresholds are zero cfu generic E. coli/100 ml.

WPS Online Medical Test Clarification

The medical test should only be a one-time submission, unless there has an individual had a medical issue, or a “change” since last submission (see below).

The following circumstances would require another medical evaluation to be done prior to the fit testing:

1. An employee/worker reports medical signs or symptoms that are related to ability to use a respirator;
2. A physician/healthcare provider, supervisor, or the respirator program administrator informs the employer that an employee needs to be reevaluated;
3. Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation; or
4. A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

FAQ regarding the New Worker Protection Standard – Part 1

As of January 2018, three requirements were added to the Worker Protection Standard.

Posted on **May 8, 2018** by [Heidi Lindberg](#), and Jeremy Jubenville, Michigan State University Extension; Melissa Millerick-May, Medicine Division of Occupational and Environmental Medicine; and Julie Yocum, MDARD

As of Jan. 2, 2018, growers need to be compliant with the new three additional requirements for the updated Worker Protection Standard (WPS). The new requirements have generated a substantial number of questions from all types of agricultural businesses. [Michigan State University Extension](#) will answer some of the most common questions about the updated WPS in this article and will cover the new respirator requirements in [Part 2](#).

What is the EPA Worker Protection Standard?

The WPS is designed to reduce the risk of poisoning and injury or accidents among pesticide handlers and workers in agriculture. The new WPS standard requires mandatory annual training for both agricultural workers and handlers and there is no grace period. All employees participating in worker or handler tasks (see brief definition below) must receive the appropriate training **prior** to starting work. Employers must keep records of these trainings.

As a part of WPS, employers are required to provide employees that will need to wear a respirator as a part of their job:

- A respiratory medical evaluation.
- Provide respirator fit-testing services free of charge at a minimum on an annual basis, or more frequently if necessitated due to physical changes (e.g., weight gain/loss, dental work, etc.).
- Training on proper use, care, maintenance and storage of the assigned respirator.

Why does the WPS exist?

According to the [EPA WPS website](#), there are 1,800 to 3,000 preventable occupational incidents involving pesticide exposures occur in the U.S. each year at agricultural operations covered by the WPS. The intent behind the WPS is to minimize or eliminate worker overexposures to pesticides, therefore reducing the likelihood of injury and illness.

Is the WPS a federal or state mandate?

The [WPS](#) is a federal mandate that is enforced at the state level.

What changed with WPS in January 2018?

As of Jan. 2, 2018 there were three requirements added to the WPS:

1. Pesticide safety training must cover the expanded content.

2. Pesticide safety information (posters) must meet the revised standards.
3. Handlers must suspend applications if workers or bystanders are in the application exclusion zone.

Who is covered by the WPS?

The WPS is in place to protect both agricultural workers and handlers, as well as potential bystanders, from pesticide exposure.

What is the difference between a worker and handler with regards to WPS?

Both agricultural workers and handlers need to be trained according to the WPS. The WPS has specific definitions for workers and handlers; workers are those who perform agricultural tasks directly related to the production of agricultural plants (weeding, watering, planting etc.) while handlers are those who do more direct tasks with pesticides such as: mix, load and apply pesticides; work on pesticide application equipment; or act as a flagger, etc. Pesticide handlers and early-entry workers **must be** at least 18 years old.

Who enforces the WPS?

The individual state agricultural agencies enforce the WPS. For example, the Michigan Department of Agriculture and Rural Development (MDARD) employs pesticide inspectors who can aid growers in developing plans to be compliant with the WPS.

What does a MDARD WPS inspection entail?

An MDARD WPS pesticide inspection will involve an inspector's visit to your farm to assess current compliance with the WPS. The visit and feedback from the inspection is aimed at helping the producer identify areas where improvement is needed, and provides an opportunity to discuss correcting missing elements of the WPS. MDARD is interested in providing compliance assistance; however, if a situation is deemed negligent, the inspection will include compliance assistance but may also result in assessed penalties.

What are the updated posters that employers need? Are the posters free or for sale?

You can download or buy updated posters that are compliant with the new WPS on the [Pesticide Educational Resources Collaborative \(PERC\)](#) website.

You can also purchase a set of posters along with the Michigan Farm Bureau Agriculture Labor and Safety Services (ALSS) Newsletter (price: \$135.99) or the Michigan Farm Bureau/Varnum Manual subscription, which are available separately at \$49.95 plus shipping and handling.

Check out [Part 2](#) of this article to learn about the new respirator requirements for the updated WPS as well as these other MSU Extension articles:

- [FAQ regarding the New Worker Protection Standard – Part 2](#)
- [Worker Protection Standard training requirements for growers](#)
- [Respirator guidelines to meet new Worker Protection Standards](#)
- [Vegetable pesticide series: Does it require a respirator?](#)

Thank you to Julie Yocum and Mike Hansen, Michigan Department of Agricultural and Rural Development, for their reviews.

FAQ regarding the New Worker Protection Standard – Part 2

The new respirator requirements for the updated Worker Protection Standard requires growers complete a respirator fit test annually.

Posted on **May 8, 2018** by [Heidi Lindberg](#), and Jeremy Jubenville, Michigan State University Extension; Melissa Millerick-May, Medicine Division of Occupational and Environmental Medicine; and Julie Yocum, MDARD



Growers undergoing their annual respirator fit testing at an MSU Extension meeting in January 2018. Photo by Heidi Lindberg, MSU Extension.

In [Part 1](#) of this article, [Michigan State University Extension](#) covered the federally-mandated Worker Protection Standard (WPS), the reasons for its implementation and what updates to the WPS occurred in January of 2018. In this article, we will cover commonly asked questions about the new respirator requirements for the updated WPS.

What are the changes to the Worker Protection Standard with respect to respirators?

Under the WPS requirements that went into effect in 2017, the employer must “provide the handler with a free medical evaluation, fit testing and respirator training in compliance with the Occupational Safety and Health Administration’s (OSHA’s) Respiratory Protection Standard.” In addition, employers are required to keep records of the medical evaluations, completed fit tests and employee training for a minimum of two years.

Respiratory Medical Evaluation

What sort of medical evaluation is required for pesticide handlers and applicators according to the new WPS requirements?

The employer must pay for or provide a respiratory medical evaluation for employees who will need to be applying pesticides requiring use of a respirator. In the greenhouse, most pesticide handlers are also applicators. This may not be true in other areas of agriculture. For pesticide applicators, the respiratory medical evaluation needs to occur prior to using the respirator for the first time and if any “significant health changes” occur (e.g., weight gain/loss, new respiratory illness etc.), or if job duties or the working conditions change in ways that put more stress on the wearer (e.g., longer hours in warmer conditions while wearing a respirator).

Employers must identify a licensed health care professional (PLHCP) to do the respiratory medical evaluation to ensure the employee is able to perform duties requiring a respirator. A medical evaluation can also be done online through services such as [3M Online Respirator Medical Evaluation](#). Occupational Medicine clinics across the state provide services such as respiratory medical evaluations and fit testing. A searchable list of locations by county may be found here at [Statewide Clinic List by County](#).

For more information, watch “[Medical Evaluations for Workers Who Use Respirators](#)” by OSHA.

How often do people need to obtain a respiratory medical evaluation?

The regulation does not give a timeline in terms of frequency for medical evaluations.

[OSHA does not definitively require annual questionnaire](#) completion, and frequency of medical evaluation is determined by four specific circumstances.

According to [OSHA’s Respiratory Protection Guide](#), employees are required to complete questionnaires for initial certification and subsequently only if:

- An employee reports adverse medical signs or symptoms related to wearing the respirator.
- The medical professional determines that medical re-evaluation is necessary.

- Observations made during fit testing suggest the need for medical re-evaluation.
- A change occurs in the workplace conditions.

Although not required by OSHA on an annual basis, questionnaire completion and review is a relatively low-cost, effective way to document employees' suitability to wear respirators and to potentially identify the need for further medical examination.

Respirators and respirator fit-testing

What type of respirators are there?

There are six types of respirators according to OSHA. They are listed in the order of increasing protection:

1. **Single-strap dust masks:** Dust masks with only one strap are not NIOSHA approved but can be useful in filtering out allergens.
2. **Approved filtering face piece respirators (dust masks):** Dust masks with two straps which are NIOSHA-approved for particulate matter but do not provide protection against gases or fumes since they do not cover the eyes.
3. **Half-face respirators:** Respirators that cover the nose and mouth, but do not cover the eyes. With correct canisters, they protect the wearer against specified gases and fumes.
4. **Full-face respirators:** Respirators that have a face shield in addition to the coverage over the nose and mouth. With the correct combination of interchangeable filters, they protect the wearer against specified gases and fumes.
5. **Loose-fitting powered-air-purifying respirators (PAPR):** Respirators that have a full face shield (hood/helmet) and a battery-powered fan and filters that are attached to a belt worn around the waist. The fan pulls the contaminated air through the filter media and then pushes the clean air into the face piece of the hood/helmet. It provides more comfort for the employee (cooling sensation from air movement), eliminates the need to wear safety glasses/goggles, reduces the amount of physical work it takes during breathing to move air through filtration media, and unlike tight fitting respirators/dust masks – may be used by those with facial hair.
6. **Self-Contained Breathing Apparatus (SCBA):** These respirators provide the most coverage and have their own air tank and are commonly used for scuba-diving, fire-fighting, and in outer space.

For pictograms and descriptions of the different types of respirators available, and for more detail, check out "[Protect Yourself Respirators: OSHA Quick Card.](#)"

Are pesticide applicators and handlers required to wear respirators?

Yes, pesticide applicators and handlers are required to wear respirators **if the pesticide label calls for them to do so**. Therefore, applicators and handlers need to have had a respirator medical evaluation and respirator fit test prior to working with pesticides.

Which pesticides require respirators?

Read and make sure you understand the labels of the pesticides you may use during this growing season. The label of the pesticides will state if a respirator is required and is based on class of pesticide and application method (drench, spray etc.). For more information, check out the “Respirator Label Language” section in the recent MSU Extension article, “[Vegetable pesticide series: Does it require a respirator?](#)”

Prior to fit testing, what do employees need to do?

All employees who will need or be required to use a respirator as a part of their job will need a respiratory medical evaluation and receive certification that documents the employee is medically able to wear a respirator as a part of their job.

What are the two types of respirator fit-tests?

There are two types of respirator fit tests: qualitative and quantitative. Qualitative fit tests use four OSHA-approved test reagents (sensory agents):

1. Isoamyl acetate
2. Saccharin
3. Bitrex
4. An irritant smoke to determine adequate fit (seal) of the chosen respirator.

Qualitative fit tests do not determine the actual amount of leakage into the respirator, but are only based on if the wearer detects a leak as the individual undergoing the fit test will smell or taste the test reagent. For example, if you are fit-tested using isoamyl acetate, which smells like bananas, and you detect that smell, you know your respirator is not fitting properly. Another commonly-used compound for respirator fit-tests is bitrex, a bitter-tasting compound.

Quantitative fit tests measure the actual amount of leakage through the respirator seal and does not rely on your senses of taste or smell as with the qualitative fit testing. It uses a machine for testing. Occupational clinics can perform this type of fit testing.

Either of these fit tests are acceptable for the new WPS.

What are the recordkeeping requirements under WPS?

Employers must keep the following records of the fit testing for a minimum of two years:

- Name of handler tested

- Type of fit test performed
- Make, model, size of respirator tested
- Date of fit test
- Records from respirator medical evaluations
- Results of the fit test (pass or fail for qualitative tests or fit factor, and strip chart recording or other record of the test results for a quantitative fit test)

Annual respirator training recordkeeping:

- Name and signature of handler trained
- Date of training
- Trainer's name
- Training topics

How does facial hair affect respirator fit testing?

Tight-fitting respirators may only be worn by individuals without facial hair (including a single day of growth). Therefore, fit-testing of tight-fitting respirators can only be performed on individuals without facial hair that interferes with the seal of the mask. Individuals with beards, mustaches or other facial hair can wear a tight-fitting respirator if it is trimmed in a way that doesn't interfere with the mask seal. If the facial hair does interfere with the mask seal, the individual must plan to use a powered-air purifying respirator with a hood. These do not require fit testing, just proper knowledge of how to wear the apparatus.

Where can I get an in-person respiratory medical evaluation prior to respirator fit-testing in Michigan?

Employees can find a local clinic by searching for [occupational health clinics in Michigan](#). You can also see your physician or licensed healthcare professional (PLHCP). You can also find the complete list by county on the [Statewide Occupational Health Clinics and Hospitals](#) list.

Check out [Part 1](#) of this article to learn about the new respirator requirements for the updated WPS as well as these other MSU Extension articles:

- [FAQ regarding the New Worker Protection Standard – Part 1](#)
- [Worker Protection Standard training requirements for growers](#)
- [Respirator guidelines to meet new Worker Protection Standards](#)
- [Vegetable pesticide series: Does it require a respirator?](#)

For more information on fit testing, watch "[Respiratory Fit Testing](#)" by OSHA.

To learn more about the types of respirators, watch "[Respirator Types](#)" by OSHA.

To learn more about Worker Protection Standards, read "[Are you ready for changes in the Worker Protection Standards?](#)" by [MSU Extension](#).

Thank you to Julie Yocum and Mike Hansen, Michigan Department of Agricultural and Rural Development, for their reviews.

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**

Some simple tips for reducing pesticide risk to pollinators

With fruit crop bloom season kicking in, it's a good time to review these recommendations.

Posted on **May 1, 2018** by [Rufus Isaacs](#), and Julianna Wilson, Michigan State University Extension, Department of Entomology



If the drive rows of your fruit crop contain flowering weeds, it is important to mow them off before applying plant protectants to protect pollinators. Photo: Emily Pochubay, MSUE

We are finally seeing some warm conditions this spring, so honey bee colonies are being brought back to Michigan by commercial beekeepers. We are also seeing wild bumble bees, mason bees, and digger bees starting to emerge from their overwintering. These are all welcome signs of spring, as are the reports of apricot bloom starting in southwestern Michigan.

With bloom season approaching for our fruit crops, we want to remind growers of the main tactics for reducing the risk of pesticides to bees. A lot more detail on this topic can be found in our free Michigan State University Extension publication [E3245 “Minimizing pesticide risk to bees in fruit crops”](#). This is a 16-page bulletin available from the [MSU Extension bookstore](#). It contains a series of tables that show the relative risk of the common fruit crop insecticides and fungicides.

The bulletin goes into depth on these topics, but here are some of the basic ideas behind the recommendations for reducing pesticide risk to bees.

Use integrated pest management (IPM) to reduce the need for sprays. Disease models are available at the [MSU Enviroweather website](#) and extension recommendations highlight the periods of infection risk that require fungicide applications during bloom. This can potentially reduce the need for treatment during dry springs. Using traps, degree day models, and thresholds for insect pests can also reduce the need for insecticide sprays. Encourage biological control and increase the use of cultural controls where possible.

Avoid pesticide sprays during crop bloom. Diseases and insect pests require active management in commercial fruit production. But orchards and fields of many fruit crops also need bees for pollination, and weakened hives will not provide the same level of

pollination as strong ones. So consider the effects on pollinators when selecting pesticides.

Apply pesticides after sunset or before sunrise, or when air temperature is below 50°F.

This is one way to reduce direct exposure of pollinators to pesticides. It can be challenging on large farms or when spring weather provides a slim window of suitable conditions, but some beekeepers have reported improved colony health at farms that have adopted this practice.

Select the least toxic pesticides and formulations when possible. The [MSUE Fruit Pest Management Guide \(E154\)](#) provides information on relative risk to pollinators, natural enemies and predatory mites in some tables. This information is based mostly on toxicity to honey bees, and it can be a good way to compare among products. Also, see the tables in the [E3245](#) mentioned above. When there are multiple formulations of the same product available, select the liquid or dissolvable formulations over dusts as those can be picked up with pollen by bees and taken back to the hive.

Reduce drift onto areas outside crop fields. Reducing drift is part of the state pesticide training, because it is critical for avoiding unintended effects on wildlife, water sources, etc. Bees will gather pollen and nectar from flowers outside crop fields, and the wild bees will also nest there, so it is important to keep the application where it was intended. Springtime sprayer calibration, targeted application, and nozzle selection to reduce fine droplets can all help keep sprays where they are intended.

Remove flowering weeds from crops. Access to a diversity of food sources is helpful for bee development, but if the drive rows in your fruit planting contain a carpet of blooming dandelions, clover or other bee-attractive flowers, plan to mow them before spraying to help reduce pesticide exposure – **not just during bloom, but through the entire growing season.**

Provide bee-friendly habitat away from crops. These can be trees, shrubs, wildflower plantings, or unsprayed flowering cover crops that bees like to visit. Wild bees also need places to nest and develop their offspring. A separate guide on this topic is online in another free bulletin available for free download at [Establishing Wildflower Habitat to Support Pollinators of Michigan Fruit Crops](#).

Develop and implement a pollination contract with your beekeeper. Pollination contracts are often sealed with a handshake agreement. But a written agreement can clarify how many colonies will be delivered, where and when by the beekeeper and what the grower should do to alert the beekeeper if there are treatments being applied nearby. Example contracts are easily found online as a way to get started.

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>