Northern Michigan FruitNet 2014
Northwest Michigan Horticultural Research Center

Weekly Update
September 2, 2014

CALENDAR OF EVENTS

9/4	**NWMHRC Open House – 35th Anniversary**
9/5	**Weathering the Climate: Cultivation & Technology in Grape Production** NMC Hagerty Center, Traverse City
9/7	**Harvest Meeting of the Midwest Nut Producers Council** Clarksville Research & Extension Center
12/9-11	**Great Lakes Fruit, Vegtable & Farm Market EXPO** DeVos Place, Grand Rapids

2015

1/13-14	**NW Michigan Orchard & Vineyard Show** Grand Traverse Resort, Acme, MI
3/4	**Winery Development Pre-Conference** MSU – Kellogg Hotel & Conference Center
3/4-6	**Michigan Grape & Wine Conference** MSU – Kellogg Hotel & Conference Center

Northwest Michigan Horticultural Research Center Annual Open House
September 4, 2014
Concurrent Cherry, Grape, and Hop Sessions

2:30 PM	**Grounds Open**
3:00 – 3:30	**NWMHRC Cover Crop Trials** *Dr. George Bird, Dept. of Entomology, MSU*
3:30 – 4:00	**Maximum Residue Limits in Cherries and Apples** *Dr. Mark Whalon, Dept. of Entomology, MSU*
4:00 – 4:30	**Comparative Results from New Cherry Training Systems** *Dr. Greg Lang, Dept. of Horticulture, MSU*

4:30 – 5:00 **New Developments Towards the Identification of an Armillaria Resistant Rootstock**
Drs. Ray Hammerschmidt and Amy Iezzoni
Dept of Plant Soil and Microbial Sciences, Dept of Horticulture, MSU

3:00 – 5:00 **Grape Variety Trial After Cold Damaging Winter of 2013-2014**
Dr. Paolo Sabbatini, Dept of Horticulture, MSU
Dr. Duke Elsner, Small Fruit Educator, MSU Extension

4:00 – 5:00 **MSU Hop Research, Education, and Outreach**
Walk through the NWMHRC hop cultivar trial; discuss best management practices and hop pests and diseases
Dr. Rob Sirrine, MSU Extension

5:15 – 6:15 **Social Hour**

6:15 **Dinner and Leelanau Horticultural Society Annual Meeting**

The NWMHRC Open House is hosted by AgBioResearch, Michigan State University Extension, the Leelanau Horticultural Society, and the Northwest Michigan Horticultural Research Foundation. Educational sessions are *free* and open to all. To reserve a dinner ticket, please call (231) 946-1510 or email Jackie at baase@msu.edu by **August 29, 2014** or after August 29, contact Nikki at 231-946-1510 or rothwel3@msu.edu. Tickets can be purchased at the door. The dinner will be catered by *Ethnic Garden Catering* and will feature locally produced food; cost for dinner tickets is $15 per person. For more information, contact the NW Michigan Horticultural Research Center at 231-946-1510.

Northwest Michigan Regional Report – August 2, 2014

E. Pochubay and D. Elsner, MSUE Educators

Apple harvest has begun and quality is looking good. Codling moth and apple maggot catches are up in some areas. Grapes are ripening and some grapes have moderate to high disease pressure.

Growers are now harvesting early season apple varieties and overall size and quality looks good. We have received a few apples for maturity testing here at the station – this morning we tested starches in Gingergold from an orchard in Leelanau. Although these apples are not quite ready to be harvested, they were tasty and will be ready soon. Weekly apple maturity tests and reports will begin later this week.

In apples, growers are spraying for apple maggot and codling moth at this time. Second generation codling moth adults have been active for the last few weeks and in some sites, young CM larvae could be present at this time. As mentioned in previous reports, recent AM and CM numbers have been variable throughout the region; some sites in Benzie reached upwards of 18 AM per trap, while we have caught few AM in traps at the station this season. A few sites in Leelanau were reported to have 50+ CM moths per

trap this week; at the NWMHRC, we found a total of one CM. After two weeks of no obliquebanded leafroller moth captures in apples, OBLR are active at low levels here at the station (4 moths per trap). We have observed and had reports of high European red mite numbers and in some orchards, mites have been challenging to manage.

Spotted wing drosophila captures have increased in the last two weeks and could be a concern in raspberries, blackberries, and blueberries. Last week, we caught 10-fold more SWD in the region compared with the previous week. We have not collected SWD trap data from all of our monitoring sites at this time. However, we counted a total of 390 SWD in six traps at the station today, which is a small jump from last week's total of 290 SWD. We will provide a more detailed report on SWD captures to FruitNet subscribers later this week.

Wine Grapes
Recent rains have increased the risk of Botrytis and cluster rots in early ripening varieties. Powdery mildew infection levels are now high on susceptible varieties at some sites. Insect activity has been light, but as fruit brix levels come up, wasps, ants and Drosophila fruit flies may become issues. Fruit depredation by birds and raccoons may be severe this year. With such a small crop load in most vinifera vineyards, it won't take much of a loss to birds to greatly reduce the harvestable crop. Raccoons may take a greater share than usual this year since a lot of the crop is low in the canopy on sucker shoots.

Cultivars in verasion:

- Vinifera- Zweigelt, Pinot Noir, Dornfelder, Siegerrebe, Madeleine Angevine
- Hybrids- Frontenac, Noiret, St. Croix, LaCrescent, Brianna

MICHIGAN BROWN MARMORATED STINK BUG REPORT FOR AUGUST 28, 2014

A single brown marmorated stink bug adult and two nymphs were caught near Stevensville, Michigan during the week of Aug. 22-29, 2014.

Posted on **August 29, 2014**, MSUE News, by **Julianna Wilson**, Larry Gut, Michigan State University Extension, Department of Entomology

This is the eighth weekly report of the Michigan State University Extension brown marmorated stink bug (BMSB) statewide monitoring program for 2014. A single adult was captured in a trap and two nymphs were found on a nearby Autumn Olive bush (*Elaeagnus umbellata*) at a non-agricultural site near Stevensville, Michigan in Berrien County this week. Elsewhere in the trapping network, no BMSB have been captured in any of our other traps or in sweep netting at the 69 sites being monitored throughout the state.

The monitoring network uses pyramid-style, pheromone-baited traps set up at sites that favor BMSB, near riparian areas or along major transportation corridors in the following counties: Monroe, Lenawee, Oakland, Macomb, Livingston, Ingham, Lapeer, Saginaw and Bay on the

east side of the state, and Antrim, Grand Traverse, Leelanau, Benzie, Oceana, Newaygo, Kent, Ionia, Ottawa, Allegan, Van Buren and Berrien on the west side of the state.

The majority of the sites in the network include farms that grow a variety of fruit and vegetable crops including apples, tart cherries, sweet cherries, peaches, blueberries, raspberries, tomatoes, peppers, and sweet corn. In addition, some of our traps have been placed along roadsides next to field crops, or in urban and suburban areas where homeowners have reported seeing BMSB in the past. The site where we captured the one adult and two nymphs this week is one of our urban sites where BMSB were found in significant number last year.

Although we continue to catch little to no BMSB each week, we know that BMSB are present in Michigan because of reports that have come mainly from homeowners in various parts of the state, and from sweep netting conducted in the edge of soybean fields. This monitoring network has been set up to provide early warning should BMSB start showing up in greater numbers in fruit and vegetable production areas as it has in mid-Atlantic states over the last decade.

To learn more about how to monitor for the brown marmorated stink bug, distinguish it from other similar-looking stink bugs, what crops it favors, and management strategies should populations reach the threshold where management is necessary, visit MSU's Brown Marmorated Stink Bug website.

The weekly BMSB statewide monitoring report has been funded through Project GREEEN and Michigan State University Extension. This output is generated through a network of MSU Extension field staff and campus specialists. We would like to acknowledge the following team members and thank them for their weekly scouting efforts and input into this report: Peter McGhee, Michael Haas, Bob Tritten, Mark Longstroth, Brad Baughman, Carlos Garcia, Amy Irish-Brown, Lina Rodriguez Salamanca, Ben Philips, Ben Werling, Mark Whalon, Karen Powers, and Nikki Rothwell.

Dr. Gut's work is funded in part by MSU's AgBioResearch.

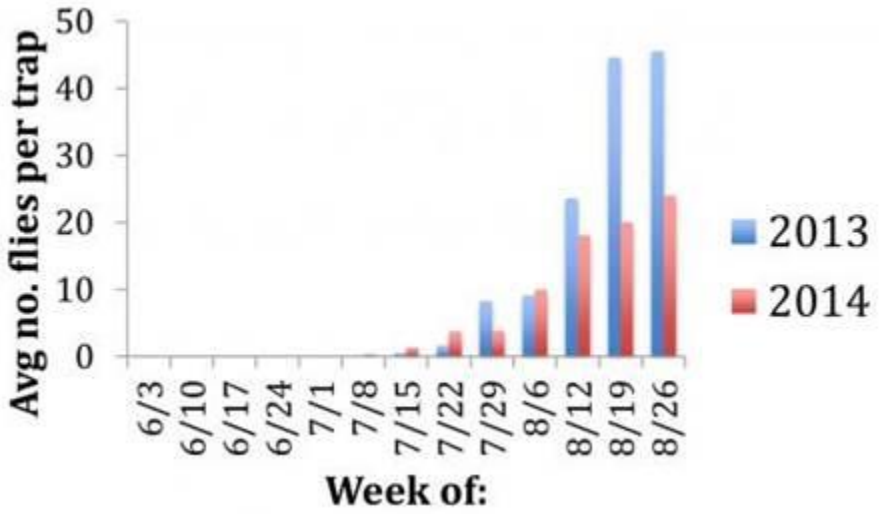
MICHIGAN SPOTTED WING DROSOPHILA REPORT FOR August 26, 2014

Spotted wing Drosophila numbers continue to rise across the monitoring network. Protect susceptible crops where they are detected.

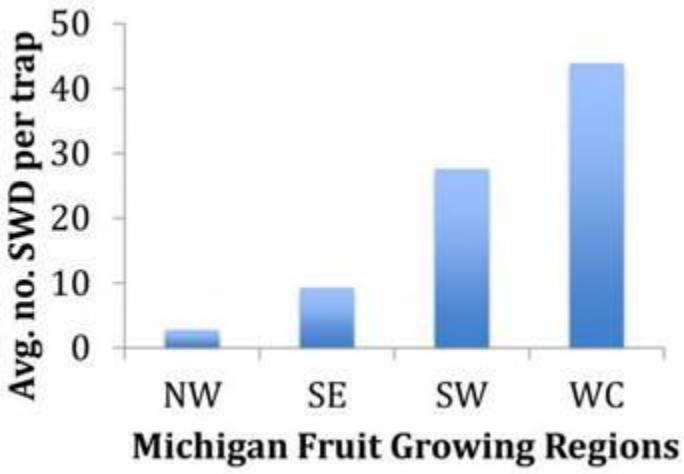
Posted on **August 26, 2014**, MSUE News, by **Julianna Wilson**, and Rufus Isaacs, Michigan State University Extension, Department of Entomology

This is the tenth weekly report of the Michigan State University Extension spotted wing Drosophila (SWD) statewide monitoring program for 2014. Our network of traps across more than 100 sites was checked during the week of Aug. 18 and shows that SWD activity is continuing to increase. There was a total of 1,598 male and 900 female SWD trapped, up from 1,327 and 658 the week before, from the following counties in our trapping network: Berrien, Van Buren, Allegan, Ottawa, Kalamazoo, Kent, Ionia, Montcalm, Oceana, Muskegon, Antrim, Leelanau, Grand Traverse, Benzie, Ingham, Genesee, Livingston and Oakland.

Comparison of average trap catches by week between 2013 and 2014.



Comparison of average SWD adults captured per trap by region. This week trapping is reported from 30 sites in the northwest (NW) counties of Antrim, Benzie, Grand Traverse, and Leelanau; 6 sites in the southeast (SE) counties of Ingham, Genesee, Livingston, and Oakland; 44 sites in the southwest (SW) counties of Allegan, Berrien, Kalamazoo, Ottawa, and Van Buren; and 26 sites in the west central (WC) counties of Ionia, Kent, Montcalm, Muskegon, and Oceana.



Of the traps that were checked this week, 84 percent of traps contained SWD, which is similar to last week. The average number of SWD per trap increased from 20 last week to 24 this week across the network. SWD averages per trap still remain low in traps placed in the four northwest counties, with only three flies caught per trap on average. If SWD has not been found in your monitoring traps, be on alert for this pest as susceptible fruit crops start or continue to ripen as the mid-late summer increase in population is underway in most of the state. Susceptible crops include most thin-skinned fruit, such as strawberries, raspberries, blueberries and cherries

We would like to stress that SWD can only infest fruit when they are ripening or ripe. What this means in a practical sense is that the focus of SWD monitoring and management efforts should be in susceptible fruit during the pre-harvest and harvest period **only if SWD are detected.** Tight application intervals are needed to maintain coverage sufficient to protect fruit from SWD. The duration of residual control will vary based on the insecticide, and there are some guides to the length of control you can expect based on recent research in blueberries. This is posted on page 8 of "SWD Management Recommendations for Michigan Blueberry." We have also not found any benefit to treating plantings for SWD post-harvest, and so we recommend that growers save their time, money and pesticide efficacy for pre-harvest treatments next season.

When adult SWD are found, new generations are being produced every one to three weeks depending on weather conditions. In addition to the use of monitoring traps to detect the adult flies, a simple salt solution of 1 cup of salt per gallon of water can be used to assess fruit for larval infestation. Leave the fruit in the solution for a minimum of 15 minutes then check for small white larvae. For more information on SWD monitoring and management strategies, and to read past reports, visit MSU's Spotted Wing Drosophila website.

The weekly SWD statewide monitoring report has been funded through Project GREEEN and Michigan State University Extension. This output is generated through a network of MSU

Extension field staff and campus specialists. We would like to acknowledge the following team members and thank them for their weekly scouting efforts and input into this report: Rufus Isaacs, Keith Mason, Steve VanTimmeren, Larry Gut, Peter McGhee, Michael Haas, Bob Tritten, Mark Longstroth, Brad Baughman, Carlos Garcia, Karen Powers and Nikki Rothwell.

Dr. Isaacs' work is funded in part by MSU's AgBioResearch.

MEALYBUGS AND LEAFROLL VIRUS IN VINEYARDS

Scout now to determine presence or absence of leafroll virus and its vector, mealybugs.

Posted on **August 27, 2014, MSUE News,** by **Rufus Isaacs**, and Keith Mason, Michigan State University Extension, Department of Entomology, and Annemiek Schilder, MSU Extension, Department of Plant, Soil, and Microbial Sciences

Mealybugs feeding on a grape trunk, exposed after stripping off some bark. This photo shows mealybugs in different stages of development, and note the sticky honeydew droplets excreted by these insects.

This 2014 summer, Michigan State University Extension staff have detected infestations of mealybugs in some southwest Michigan vineyards. Mealybugs are small, oval insects with a fuzzy, white covering, and they tend to occur in protected areas of the vine, especially under the loose bark. Some mealybugs can cause damage from their feeding and contamination of clusters, but others transmit viruses, making them much more of a concern.

About a decade ago, we experienced the grape mealybug becoming a pest in some vineyards when their numbers got so high that their sticky excretions led to black sooty mold developing on grape clusters before harvest. This was more of an issue in white juice grape varieties due to fruit quality concerns. However, this situation hasn't been reported to us in many years, so it seems that biological control has regulated the grape mealybug populations.

Mealybugs are also able to transmit viruses, and we have now detected mealybug infestations across a region where there has also been detection of grape leafroll virus. Our insect samples from the 2014 collections are currently being identified to get a firm species identification, and the extent of the infestation is also being determined. Leafroll virus can infect all types of grapevines, but it reduces yields and fruit quality only in vinifera grapevines.

Symptoms of grape leafroll virus infection in a white wine vinifera grape variety, Chardonnay (left photo), which exhibits rolled leaf edges and lighter leaf color than uninfected vines. The right photo shows the symptoms in red wine vinifera grape varieties, as seen here in a Pinot noir vine.

For winegrape growers, mealybugs and leafroll virus is a pest complex to be aware of and to be looking for in your own vineyards. Our scouting over the last few weeks has detected virus symptoms that are more distinct in recent years, perhaps due to the insect's spread, but more likely due to the stress that vines have experienced over the past year. Virus symptoms are often more pronounced in these difficult growing seasons.

Vineyard managers, consultants and scouts can sample vines for mealybugs by examining the trunks of their vines under the bark and in the tight spaces within the trunks. We recommend that vineyard managers look for mealybugs as part of their vineyard scouting to determine the extent of this pest's distribution. On mature vines, strip a section of bark and look underneath for white patches of fluffy material or the small white-pink insects. Adults are 2-3 millimeters long and the nymphs can be just 1 millimeter long. The mealybugs will move slowly once exposed to the light, and they also generally have ants associated with them. The ants are often the first thing you'll see when removing the bark as they "farm" the mealybugs to get their sugary excretions. In some cases, controlling the mealybugs also requires controlling the ants. Mealybugs may also be found on the cordon area of the vine. It is also possible that they will move to clusters later in the summer.

Mealybug management

Until we know what species of mealybug is present in these vineyards and how far it is distributed, the management approach will be somewhat generic based on experiences in other regions. These points are the most important to mention at this time:

- We recommend that vineyard managers or their staff scout vineyards carefully for leafroll symptoms and look under the bark and on the cordon wood for mealybugs and leafroll symptoms.
- If mealybugs are detected or suspected, collect a sample of the insects and send to your local MSU Extension educator or to Howard Russell at MSU Diagnostic Services. If grape leafroll virus is suspected, leaf samples may also be collected, kept cool and submitted for analysis by Annemiek Schilder's lab at MSU, 578 Wilson Road Rm. 105, East Lansing, MI 48824. We are currently applying for funds to support expanded testing this year.
- If mealybugs are found, these can be controlled by application of Movento 2SC insecticide at 6 ounces per acre with a penetrating adjuvant – superior oil at 0.5-1 percent by volume works well. **It is important to observe the crop safety restrictions on oils applied during high temperature conditions, and do not tank-mix with Captan or sulfur applications.** High water gallonage should be used to ensure that the insecticide penetrates into the canopy and gets into the bark crevices. Evaluate after two to three weeks and determine whether further control is needed. If so, make a follow-up application of the same treatment, and note that there is a 12-ounce per acre per season limit to the use of Movento in grapes. Belay and Scorpion insecticides have also shown good efficacy against mealybugs in trials in other grape production regions.
- Mealybugs can be moved by people, machinery and on harvested grapes during the busy harvest season, so vineyards with active mealybug colonies should be harvested with care to avoid their spread.

These mealybug detections have been in Berrien County, and we are currently working to check additional vineyards before harvest. Our information presented here is based largely on experiences in other regions, and we will need to learn more about how to manage this pest in Michigan over the coming weeks and months. As that information is available, it will be provided to grape growers.

Drs. Isaacs and Schilder's work is funded in part by MSU's AgBioResearch.

DON'T LET BUNCH ROTS RUIN YOUR GRAPES

If humid conditions persist, Botrytis pressure may be high this year. Remove leaves from around grape clusters and protect clusters with effective fungicides.

Posted on **August 26, 2014 MSUE News,** by **Annemiek Schilder**, Michigan State University Extension, Department of Plant, Soil and Microbial Sciences

Early symptoms of Botrytis bunch rot in grapes.

This 2014 growing season, Botrytis bunch rot may be a bigger menace than usual due to prevailing moisture and high humidity. Botrytis bunch rot is caused by the fungus *Botrytis cinerea* and is the most common cause of pre-harvest losses of wine grapes. Another problem may be sour rot, caused by acetic acid bacteria, yeasts and certain fungi. Sour rot can explode after heavy rainfall during fruit ripening, resulting in swelling and bursting of berries, especially near woods. Fruit flies get in on the melee and help spread the microbes on their bodies. Botrytis and sour rot can be present in the same cluster, in addition to Phomopsis and black rot, so it is important to distinguish the culprits. Bunch rot often begins in one or a few berries, and can consume most of the cluster under the right conditions. Sometimes when rot is prevalent or developing faster than expected, the harvest date has to be moved up to avoid excessive losses.

There are various fungicides available for control of Botrytis bunch rot while very few aid in sour rot control. Sour rot is best controlled by leaf pulling around the clusters between bunch closure and veraison to reduce humidity and increase sun exposure. While biocontrol agents like Serenade (*Bacillus subtilis*), Actinovate (*Streptomyces lydicus*) and Blightban (*Pseudomonas fluorescens*) may help by competing with sour rot microbes, leaf pulling is the main control method. Growers in Ontario apply potassium metabisulfite to “dry out” the clusters and kill yeasts and bacteria.

Mid-symptoms of Botrytis bunch rot in grapes.

For Botrytis treatments, Michigan State University Extension advises growers to make sure to alternate fungicides in different chemical classes to avoid fungicide resistance development. The Fungicide Resistance Action Committee (FRAC) code indicates the mode of action; any fungicides with the same FRAC number share the same mode of action. A conventional standard that has been quite effective in our fungicide efficacy trials is a Pristine/Vangard alternation: bloom (Pristine), bunch closure (Vangard), veraison (Pristine) and two weeks before harvest (Vangard). Adding another chemical class (e.g., Elevate) would be even better from a fungicide resistance management perspective. Biological control agents and reduced-risk products also can be used, particularly during lower risk periods (e.g., bunch closure) or when approaching harvest to avoid fungicide residues.

Late symptoms of Botrytis bunch rot in grapes.

Below is a list of products with efficacy against Botrytis bunch rot.

- **Elevate**: fenhexamid, FRAC group 17, locally systemic; zero-day pre-harvest interval (PHI). Good to excellent preventive and limited post-infection activity.
- **Endura**: boscalid, FRAC group 7, systemic, 14-day PHI. Good to excellent preventive and post-infection activity. Use at an 8-ounce rate for Botrytis control.
- **Flint**: trifloxystrobin, FRAC group 11, locally systemic, 14-day PHI. Moderately good preventive and limited post-infection activity. Works better at higher rate.
- **Inspire Super**: difenoconazole + cyprodinil, FRAC groups 3 and 9, systemic, 14-day PHI. It is mainly the cyprodinil component that provides Botrytis control. Good to excellent preventive and post-infection activity.
- **Luna Experience**: fluopyram + tebuconazole, FRAC groups 7 and 3, systemic, 14-day PHI, 10-day REI for leaf pulling, trying and training in wine grapes. Good to excellent preventive and post-infection activity.
- **Pristine**: pyraclostrobin + boscalid, FRAC groups 11 and 7, systemic, 14-day PHI. Good preventive and post-infection activity, but only at the high rate of 18.5-23 ounces per acre.
- **Rovral**: iprodione, chemical group, FRAC group 2, locally systemic, seven-day PHI. Moderate to good preventive and limited post-infection activity; activity is improved by addition of oil or non-ionic spray adjuvant.
- **Scala**: pyrimethanil, FRAC group 9, systemic, seven-day PHI. Good to excellent preventive and post-infection activity.
- **Switch**: cyprodinil and fludioxonil, FRAC groups 9 and 12, systemic, 14-day PHI. Provides good *Botrytis* control. Preventive and post-infection activity.
- **Topsin M**: thiophanate methyl, FRAC group 1, systemic, 14-day PHI. Good preventive and post-infection activity.
- **Vangard**: cyprodinil, FRAC groups 9, systemic, seven-day PHI. Good to excellent preventive and post-infection activity.

Reduced risk and biocontrol agents:

- **Botector** (*Aureobasidium pullulans*): biocontrol agent, locally systemic, zero-day PHI. Good to excellent preventive and limited post-infection activity.
- **Regalia**: giant knotweed extract, FRAC group NC, induced resistance, zero-day PHI. Good to excellent preventive and limited post-infection activity.
- **Serenade** (*Bacillus subtilis*): biocontrol agent, protectant, zero-day PHI. Fair to moderate protectant activity. Organic formulation can be used in organic vineyards.

Dr. Schilder's work is funded in part by MSU's AgBioResearch.

BOTRYTIS FUNGICIDE-RESITANCE SURVEY FOR GRAPE GROWERS

Participate in a fungicide-resistance survey for Botrytis in grapes.

Posted on **August 26, 2014, MSUE News,** by **Annemiek Schilder**, Michigan State University Extension, Department of Plant, Soil and Microbial Sciences

Grape growers rely on fungicides for management of Botrytis bunch rot, caused by the fungus *Botrytis cinerea*, which is a threat to fruit yield and quality. The number of effective fungicides for Botrytis is relatively limited since this fungus is not sensitive to many fungicides commonly used for most other fungi. Erosion of fungicide efficacy against *B. cinerea* due to fungicide resistance development has been observed in other crops and regions of the United States. For instance, multifungicide resistance is common in Botrytis on strawberries in the southeastern United States. This may not be surprising as strawberries have a long harvest season and receive as many as 20 fungicide applications per season. Usually, the more fungicide applications are made per season, the greater the risk of fungicide resistance development for those fungicides that are prone to it.

Determining the resistance profile of *B. cinerea* on grapes in Michigan will help assess the current status of sensitivity of *B. cinerea* to commonly used fungicides and will help Michigan State University Extension specialists formulate appropriate disease and fungicide resistance management programs. This will benefit growers in the long run by extending the effective lifetime of available fungicides and reducing losses due to poor disease control or money spent on fungicides that don't work.

For this survey, we are looking for grape clusters or berries with sporulating Botrytis bunch rot from 20 vineyards (10 random clusters per vineyard). If you have Botrytis bunch rot and would like your vineyard to be included in the survey, please contact Jerri Gillett at gillett@msu.edu or 517-355-7539 to arrange for the samples to be sent to our lab at MSU. If you participate, you will receive a full summary report on the fungicide resistance survey with data specific to your vineyard only identified to the grower who supplied the samples. Thanks in advance!

Dr. Schilder's work is funded in part by MSU's AgBioResearch.

HOW TO CALCULATE ALPHA ACID LEVELS OF HOPS BEFORE HARVESTING

In addition to dry matter testing, it is important to determine alpha acid levels before harvesting hops.

Posted on **August 22, 2014, MSUE News,** by **Diane Brown**, Michigan State University Extension

A recent Michigan State University Extension article on determining harvest time, "Harvest time approaching for hop growers," details the process needed to determine the dry matter content of

your hops to determine whether or not they have reached maturity. This is important to help ensure that essential oils have developed sufficiently. Additionally, before breweries will buy your hops, they will also want to know what the alpha acid levels are.

Before hops are harvested, you will want to determine that the alpha acids have reached the targeted value expected for the cultivar. Typically, sample of fresh cones are sent to a lab for analysis to determine alpha and beta acids. Fresh hops are generally dried down to 8-10 percent moisture to prevent spoilage.

Here is a formula to convert alpha acid and beta acid concentrations derived from analysis of wet hops to estimated dry hop concentrations at 10 percent moisture:

Tested acid value x [90/(100-percent moisture)]

Actual dry hop values may be different and will need to be tested to ensure accuracy, but the estimated values will help to determine whether or not the hops are ready to harvest. To use this formula, you will need the tested values for alpha acids, beta acids and the percent moisture in the test sample. Thanks to KAR Laboratories, Inc. for providing the formula.

For an article with sample calculations and a list of laboratories that offer testing, go to "Determining when hops are ready to harvest."

This article was published by **Michigan State University Extension**. For more information, visit http://www.msue.msu.edu. To have a digest of information delivered straight to your email inbox, visit http://bit.ly/MSUENews. To contact an expert in your area, visit http://expert.msue.msu.edu, or call 888-MSUE4MI (888-678-3464).

APHIDS ON HOPS REPORTED IN SIGNIFICANT NUMBERS

As harvest approaches, growers should continue to scout for a number of pests and diseases, including aphids.

Posted on **August 22, 2014, MSUE News,** by **Erin Lizotte**, Michigan State University Extension

A wingless aphid on hop. Photo by Erin Lizotte, MSU Extension

Like 2013, as harvest approaches growers are reporting high numbers of aphids in their hopyards, warranting management. At this time, Michigan State University Extension has not confirmed the species as Damson hop aphid (*Phorodon humuli*), but based on the prevalence and importance of this pest, that is likely the case. Damson hop aphid is one of the primary pest species in hop production in the northern hemisphere and can cause major damage and economic losses. Aphids generally thrive under greenhouse conditions and can be moved to new locations via nursery stock. Regardless of the species of aphid present, growers should be managing to prevent plant and cone damage.

The following information is summarized from the publication, "Field Guide for Integrated Pest Management in Hops."

Damson hop aphids are small, 0.05-0.1 inches, pear-shaped, and soft-bodied insects that may be either winged or wingless. Wingless aphids are pale white to green and are typically found on the underside of leaves. Winged aphids are dark green or brown with black markings on the head and abdomen. Aphids have two cornicles or "tailpipes" at the end of the abdomen.

Aphids remove nutrients and moisture from leaf and cone tissue with their piercing and sucking mouthparts. Damaged leaves may curl and wilt, heavy infestations can cause defoliation. Cone feeding can cause wilt like symptoms in the cones and browning. When feeding, aphids secret sugary honey dew that can support the growth of secondary fungi and bacteria, most notably sooty mold. Sooty mold reduces photosynthesis and can make cones unsaleable. Aphids can also transmit viruses.

Damson hop aphids overwinter as eggs on *Prunus* species – genus of trees and shrubs, which includes plums, cherries, peaches, nectarines, apricots and almonds – which are prevalent in agricultural settings and the landscape in Michigan. In early spring, eggs hatch into stem mothers that give birth to wingless females that feed on the *Prunus* host. In May, winged females are produced and travel to hop plants where additional generations of wingless females are produced. As many as 10 generations may occur in a season with each female producing

30-50 offspring in her lifetime. Aphids do not reproduce as quickly in hot and dry weather, preferring more moderate temperatures and moisture levels. As cold weather approaches, winged females and males are produced and move back onto a *Prunus* host where they mate and lay eggs before winter. We expect that this migration off of hops and onto plants in the *Prunus* genus will occur sometime in September in Michigan.

Monitoring for aphids should begin when daytime temperatures exceed 58-60 degrees Fahrenheit and continue through harvest. Aphids are not tolerated after flowering because cone infestations are very difficult to treat. Growers experiencing aphid infestations should consider that excessive nitrogen application and large flushes of new growth favor outbreaks. Ideally, growers would apply early season controls to limit population growth over the season.

Pymetrozine, such as Fulfill, is commonly recommended in the Pacific Northwest because it is effective and helps preserve beneficial insects. Additionally, products containing imidacloprid (Admire Pro, Provado), spirotetramat (Movento) and thiamethoxam (Platinum) are all labeled against aphids. Organic products labeled for aphids in hop include azadiractin (Azadirect, Ecozin Plus), azadiractin+pyrethrins (Azera), potassium salts of fatty acids (Des-x insecticidal soap, M-pede), *Chromobacterium subtsudgae* (Grandevo), *Beauvaria bassiana* (Mycotrol O), mineral oil (Omni Supreme spray, Purespray green, SuffOil-X), pyrethrins (Pyganic), neem (trilogy) and Potassium silicate (Sil-matrix). Products containing synthetic pyrethroids (beta-cyfluthrin, bifenthrin, or cyfluthrin) and organophosphates (Malathion) are also labeled on hops for aphid management, but are generally avoided due to the negative effect on beneficial mites.

This article was published by **Michigan State University Extension**. For more information, visit http://www.msue.msu.edu. To have a digest of information delivered straight to your email inbox, visit http://bit.ly/MSUENews. To contact an expert in your area, visit http://expert.msue.msu.edu, or call 888-MSUE4MI (888-678-3464).

HOP GROWER INPUT NEEDED

Erin Lizotte and Rob Sirrine, MSUE

Michigan State University Extension is looking for grower assistance in identifying obstacles to economically and environmentally sustainable production. Producers, nurserymen and consultants with plants in production are asked to respond to the following brief survey. https://www.surveymonkey.com/s/6DQR373 .

Your responses are anonymous and will be reported internally to MSU faculty and staff to direct research and resource generation in the coming years. In addition, these results will be shared at the first annual meeting of hop researchers from the Midwest, Eastern US and Canada at the Great Lakes Hops Working Group in December.

We appreciate your time and contribution to supporting this emerging crop.

HOW LONG DO I KEEP ALL THIS FOOD SAFETY PAPERWORK?

With the amount of produce food safety paperwork generated by growers, it is easy to forget how long to keep something. Growers should know the standard minimum length to keep food safety records based on the Food Safety Modernization Act.

Posted on **August 27, 2014**, MSUE News, by **Phil Tocco**, Michigan State University Extension

Food safety work on farms can generate a tremendous amount of paperwork and records. Keeping track of all the moving parts and recording compliance checks can get overwhelming very quickly. The new Food Safety Modernization Act (FSMA) provides a number of guidelines with regards to record retention and access that can be used to help guide growers.

The proposed FSMA rule stipulates that all records be on the premises for at least six months. There is no requirement that these records are maintained as hard copies, just that they are maintained. Even after the six month, on-site requirement, the records need to be accessible within 24 hours for up to two years.

The ability to maintain records digitally opens up a world of storage possibilities. An inexpensive, direct-feed, desktop document scanner can significantly aid in quickly converting paper records to digital scans. Once scanned, the files can be stored in a way that the grower can easily reference them.

Another option for those records that are made on the fly is importing the log or record sheet into Google Docs or another cloud-based computing program. The logs can be created in a spreadsheet program of your choice and imported into the cloud. Meanwhile, farm workers who have smartphones can input data into that same spreadsheet using the smartphone while still in the field. Most cloud-based systems have date stamp tracking, allowing everyone to verify when the records were imported.

By using the cloud to store records, many of the issues of FSMA compliance with regards to access can largely be eliminated. If you would like more information on implementing good food safety practices in your operation, contact the Michigan State University Extension Agrifood Safety Workgroup at 517-788-4292 or gaps@msu.edu

The reference of Google Docs in this article is in no way meant to be an endorsement or condemnation of the product by Michigan State University or any of its employees or subsidiary organizations.

This article was published by **Michigan State University Extension**. For more information, visit http://www.msue.msu.edu. To have a digest of information delivered straight to your email inbox, visit http://bit.ly/MSUENews. To contact an expert in your area, visit http://expert.msue.msu.edu, or call 888-MSUE4MI (888-678-3464).

ISLAND Farmer Residency Program

The ISLAND Farmer Residency Program is searching for smart, talented journeyman farmers to participate in a farm incubator project in Northwest Lower Michigan. ISLAND's Farmer Residency Program provides land and a supportive environment to get started.

The program site is located at the heart of a food region described by Mario Batali as 'exploding', amidst a thriving nexus of markets in Traverse City, Petoskey and the Leelanau Peninsula.

Resident farmers are provided with three years' access to land, equipment and a network of technical and business advice. This is not an internship opportunity—it is a chance for experienced but landless farmers to manage their own business on the Grand Traverse Regional Land Conservancy's Maple Bay Farm, just south of Elk Rapids, Michigan.

Eager to learn more? Here's a recent article on this program.

Applications for the 2015 growing season are due on **October 1, 2014**. Successful applications received before September 15 will be offered a seed garlic bonus. Applications will be accepted each fall to bring new residents to the farm.

For more information, or to apply to the program, go the ISLAND Farmer Residency Program website, or contact Larry Dyer at larry@artmeetsearth.org.

MSU Extension programs and material are open to all without regard to race, color, national origin, gender, gender identity, religion, age, height, weight, disability, political beliefs, sexual orientation, marital status, family status, or veteran status. Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities.

WEBSITES OF INTEREST

This issue and **past issues of the weekly FruitNet** report are posted on our website:
http://agbioresearch.msu.edu/centers/nwmihort/nwmihort_northern_michigan_fruit_net
Insect and **disease** predictive information is available at:
http://enviroweather.msu.edu/homeMap.php

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

Information on **cherries** is available at the new cherry website:
http://www.cherries.msu.edu/

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

Fruit CAT Alert Reports have moved to MSU News:
http://news.msue.msu.edu