

Berry Notes

Prepared by the University of Massachusetts Fruit Team

May 2012 Vol. 24, No. 5

www.umass.edu/fruitadvisor/berrynotes/index.html

Massachusetts Berry Notes Underwriters:

Since 1932
The Best Berry Plants

- Strawberries, raspberries, blueberries, blackberries, asparagus and more!
- Where the pros go for plans and plants.
- Call for a free catalog and plasticulture guide!

41 River Road, South Deerfield, Massachusetts 01373
NOURSE
www.noursefarms.com 413.665.2658

Berry Notes is edited by Sonia Schloemann with articles written by other contributors with attribution; sources are cited. Publication is funded in part by the UMass Extension Agriculture & Landscape Program, subscription fees and generous underwriting. Questions can be directed to Sonia Schloemann at 413-545-4347, sgs@umext.umass.edu. Please cite this source if reprinting information that originates here.

CROP CONDITIONS:

IN THIS ISSUE:

CROP CONDITIONS

ENVIRONMENTAL DATA

STRAWBERRY

- ❖ Spittlebug in Strawberries
- ❖ Bloom Is A Critical Time For Control Of Botrytis Gray Mold In Strawberries
- ❖ Strawberry Clipper Damage - Does It Affect Yield?
- ❖ Tarnished Plant Bug

RASPBERRIES/BLACKBERRIES

- ❖ Disease Snapshot: Orange Rust

BLUEBERRIES

- ❖ Blossom and Twig Blight in Blueberries
- ❖ Time to Fertilize Blueberries

GRAPES

- ❖ Important Sprays for Grape Disease Management
- ❖ Mark The Date Of Wild Grape Bloom To Help Predict Spray Timings For Grape Berry Moth
- ❖ Managing Frost Damage: Background, Compensation, and Potential Options

GENERAL INFORMATION

- ❖ Encouraging Beneficial Insects on your Farm
- ❖ Wild Pollinators of Eastern Apple Orchards
- ❖ Effects of Water Quality on Pesticides

UPCOMING MEETINGS

Crop development continues to be advanced by varying amounts ahead of average years depending on location. **Strawberries** are in bloom to green fruit. Row covered fields are approaching harvest. Significant frost/freeze damage occurred in many locations. Level of damage varies around the state. Protect remaining flowers from Botrytis now (see article this issue). Scouting for early season insects (clipper, tarnished plant bug, spittle bug, two-spotted mite). **Raspberries** are in full leaf with flower buds extended. Winter injury is apparent in some varieties in some locations but many fields look good. Some primocane fields suffered frost/freeze damage but will grow out of it. Orange rust has been found in some blackberry plantings. See more on this below. **Blueberries** are in late bloom to fruit set. There may have been some losses from frost/freeze damage in some areas. Scout for cranberry fruitworm after bloom. **Grape** shoots are anywhere from 1" to 10" depending on location and variety. Shoot thinning and removing shoots from trunks is best done now while they are easy to rub off. Pre-bloom disease management is critical now. Scout for cane girdlers and flea beetle adults and larvae. **Currants and Gooseberries** are showing excellent fruit set. Watch for cane borers.



ENVIRONMENTAL DATA

The following growing-degree-day (GDD) and precipitation data was collected for an approximately two-week period, May 3 through May 9. Soil temperature and phenological indicators were observed on or about May 9. Total accumulated GDDs represent the heating units above a 50° F baseline temperature collected via our instruments for the 2012 calendar year. This information is intended for use as a guide for monitoring the developmental stages of pests in your location and planning management strategies accordingly.

Region/Location	2012 Growing Degree Days		Soil Temp (°F at 4" depth)	Precipitation (1-week gain)
	1-week gain	Total accumulation for 2012		
Cape Cod	31	234	60°	4.25"
Southeast	24	239	54°	1.75"
East	13	248	59°	0.43"
Metro West	26	187	52°	1.43"
Central	5	134	52°	0.66"
Pioneer Valley	54	234	60°	0.71"
Berkshires	33	177	57°	0.73"
Average	27	208	56°	1.40"

(Source: UMass Landscape Message #8, May 11, 2012)

STRAWBERRY

Spittlebug in Strawberries

David Handley, Univ. of Maine Extension

We have been finding spittlebug masses in some strawberry beds this week. The frothy spittle masses are found on the leaf stems (petioles), just below the leaflets, usually showing up around bloom. Although spittlebugs don't pose a significant threat to the plants, the frothy spittle masses create an annoyance for pickers.

Spittlebugs overwinter as eggs and the nymphs emerge in late May. Start scouting for spittlebugs when the plants are at about 10% bloom. Randomly inspect five one-square foot areas per field every week. On hot, dry



days the spittle masses may be at the base of the plants, so spread the leaves and inspect the crowns, leaf bases, leaf stems, and flower stems looking for the frothy spittle masses. The small, yellow-orange nymphs will be under the spittle. If the average number of spittle masses is more than two per square foot, a treatment may be warranted. Spittlebugs tend to be a greater problem in weedy fields.

Pesticides currently registered for spittlebug control include Provado®, Thionex®, Danitol® and Brigade®. (Source: Strawberry IPM

News No. 3, June 3, 2011)

Bloom Is A Critical Time For Control Of Botrytis Gray Mold In Strawberries

Annemiek Schilder, Michigan State University Extension

Botrytis gray mold, caused by the fungus *Botrytis cinerea*, is one of the most important fruit rot diseases affecting strawberries. Typical symptoms include a spreading brown rot and fuzzy gray mold on ripening berries. Wet weather and moderate temperatures are conducive to development of this disease. The bloom period is the most

important time for control of gray mold, since primary infections take place almost exclusively through the blossoms. The infections then remain dormant until the berries start to ripen. As gray mold develops on infected berries, these become sources of inoculum secondary infections of adjacent berries. Ripe and overripe berries in

particular are very susceptible and gray mold can spread rapidly at that time.

The gray mold fungus overwinters on old leaves and plant debris and can sporulate profusely on dead and decaying plant material. The spores are airborne and are usually plentiful in strawberry fields. If the bloom period is dry or good fungicide coverage is maintained, incidence of gray mold at harvest will be low. However, if primary infections get established, it will be harder to control the disease both before and after harvest. Where possible, remove sporulating berries from the field and destroy them to limit inoculum availability.

There are a number of excellent fungicide choices for gray mold control in strawberries: Switch (cyprodinil and fludioxonil) and Pristine (pyraclostrobin and boscalid) provide excellent control; both have two different active ingredients – one of which is systemic –that broaden their spectrum of activity. Pristine also provides outstanding control of fungal leaf spots and anthracnose fruit rot. Elevate (fenhexamid) is a locally systemic fungicide with good to excellent activity against gray mold. Captevate is a pre-mix of captan and fenhexamid and has a broader spectrum of activity than Elevate alone as it also protects against anthracnose and leaf spots. Scala (pyrimethanil) is a newer fungicide labeled for Botrytis gray mold control in strawberries and is similar to one of the active ingredients in Switch. Rovral and Iprodione (both iprodione) are older fungicides with good activity against Botrytis gray mold, but they can only be applied once and

not after first fruiting flower. Also, their activity is enhanced by adding a spreader-sticker.

With respect to older fungicides, a tank-mix of Topsin M (thiophate-methyl) and Captan (captan) has good activity against a broad spectrum of fungi, including gray mold. Adding Kocide (copper hydroxide) or Cuprofix (basic copper sulfate) can help tackle angular leaf spot as well. Thiram (thiram) is a broad-spectrum fungicide with fairly good efficacy against gray mold as well, but is strictly a protectant.

Just as a reminder, Cabrio (pyraclostrobin) and Abound (azoxystrobin) are **NOT** suitable for gray mold control, but are effective against anthracnose and other fruit rot and leaf spot diseases. All fungicides mentioned above have a zero-day pre-harvest interval, except Topsin M (one day), Scala (one day) and Thiram (three days). Copper products have a 24-hour re-entry interval. Remember to alternate fungicides in different fungicide classes for resistance management purposes. A table showing fungicide classes is available in the [2012 Michigan Fruit Management Guide](#) (E-154) [Ed Note: Also in [NE Small Fruit Pest Management Guide](#)].

Be careful using older fungicides like Captan, Rovral and Thiram when bees are foraging as these fungicides may be toxic to the brood when they are carried back into the hive by the worker bees. Some other fungicides may have toxicity in combination with certain insecticides or adjuvants. It would be best to spray in the evening during dry conditions or to avoid using these materials altogether. (*Source: MSU Fruit News, May 15, 2012*)

Strawberry Clipper Damage – Does It Affect Yield?

Rufus Isaacs, Michigan State University Extension

There have been some reports this spring of some intense feeding damage by strawberry clipper, *Anthonomus signatus*, in some strawberry fields. This small, reddish-brown weevil spends the winter in the leaf litter and tends to be most active in fields next to woods or other unmanaged areas. This pest seems to have survived the last winter well in some farms, and has moved into crop fields during the early growth.

While the time for management of this pest is generally past for this season, it is important for growers to know about this pest and some important research from Cornell University about how plants can respond to clipper feeding.

For more on the identification of this pest and its damage, read Cornell Cooperative Extension's [Small Fruit Crops: Strawberry Bud Weevil \(Clipper\)](#).

The Cornell University research by Marvin Pritts, Greg Loeb and Joe Kovach showed that many cultivars can tolerate clipping damage by this pest, and these can respond to the feeding activity by making the remaining secondary and tertiary fruit larger. This response then results in little economic effect on many of the tolerant cultivars such as Jewel and Kent.

A summary of the Cornell study can be read at [Is Strawberry Clipper \(Anthonomus signatus\) an Economically Important Pest?](#)

As a reminder to strawberry growers, Cornell also as a [diagnostic tool for berry crops](#). (*Source: MSU Fruit News, May 15, 2012*)

Tarnished Plant Bug

Sonia Schloemann, UMass Extension

This pest causes “cat faced” or “button berries” in strawberries and misshapen fruit in raspberries. Tarnished plant bug adults and nymphs cause damage to the fruit but nymphs are more abundant so are of greater concern. Nymphs are yellow/tan to light green, have long antennae, look a bit like aphids but unlike aphids they move very fast when disturbed.

Scouting for nymphs in strawberry by striking the plant over a white colored dish or piece of paper as this will knock the nymphs free from plants. Immature TPB (nymphs) are sampled by shaking flower trusses over a flat white surface. Thirty flower clusters should be sampled evenly from across the field (typically 6 clusters at 5 locations or 5 clusters at 6 locations). If 4 or more flower clusters are infested with nymphs (regardless of how many) a spray is recommended. A follow-up spray application may be made after bloom if TPB are still present in high numbers (check harvest interval before selecting material). If the threshold is exceeded, consider treating with one of the labeled materials below. DO NOT SPRAY INSECTICIDES DURING BLOOM.

Click [here](#) for excellent images of TPB from Ontario.

Conventional

Assail SG acetamiprid @ 4.0-6.9 oz/A

***Brigade WSB bifenthrin @ 16-32 oz/A**

***Danitol EC fenpropathrin @ 10-2/3 fl oz/A**

Malathion 57 EC malathion @ 1.5-3.0 pt/A

***Dibrom 8EC naled @ 1 pt/A**

Pyrethron crop spray 0.5EC pyrethrin @ 2-12 oz/A

***Actara thiamethoxam @ 4 oz/A (suppression only)**

** restricted use material*

Organic

Mycotrol O Beauveria bassiana strain GHA @ 0.25 to 1 qt/A

PyGanic 1.4 EC_{II} pyrethrin @ 16-64 fl. oz/A or

PyGanic 5.0 EC_{II} pyrethrin @ 4.5-18.0 fl. oz/A

No product endorsement over like products intended.

Always read the label prior to use.

RASPBERRIES/BLACKBERRIES

Disease Snapshot: Orange Rust

Zachary Frederick and Kerik Cox, Cornell Univ.

Causes: *Arthuriomyces peckianus* & *Gymnoconia nitens*

When to watch for it: Spring through late summer

First line of defense: Removal of all infected raspberry canes and roots

Summary: Orange rust is a disease of considerable economic importance in the Northeastern United States, but has been a reported problem elsewhere. Red raspberries are the only *Rubus* species considered to be immune to this pathogen. Blackberry infections are often the most severe, but the disease has been observed in purple and black raspberries.

Orange rust can be seen as new growth appears in the spring. New shoots are often deformed and spindly. Infected plants will produce many shoots, but none of them will be very strong or well formed. The first visible signs of infection are on the upper surface of newly emerging leaves. A few weeks later, the next stage (Aecia) will erupt from the under-sides of leaves and sporulate profusely. Infected leaves will typically abscise in the early summer, and infected floricanes will never produce blossoms. New infections result from the colonization of leaves by aeciospores, which are wind disseminated. During cooler weather the pathogen grows

in the intercellular spaces within leaves and canes, and the pathogen will eventually colonize the roots.



Right: Orange rust on a blackberry leaf. The erupting aecia are visible and powdery orange aecial spores can be released into the wind.

Once the roots are colonized every cane produced will be infected, making chemical control entirely impractical. In late summer, infected plants will develop telia that will appear like many small black pustules on the undersides of leaves. The teliospores produced by *G. nitens* can overwinter, but the pathogen primarily overwinters as mycelia in the intercellular spaces in the roots. (**Source:** *New York Berry News*, Vol. 11, No. 4. April 17, 2012)

BLUEBERRY

Blossom and Twig Blight in Blueberries

Annemiek Schilder, Michigan State University

Cold, rainy conditions with freezes during bloom are conducive to the development of blossom and twig blight in blueberries. Frost can cause microscopic wounds on plant tissues that allow invasion by fungi and bacteria. Extended duration of wetness of plant surfaces enhances fungal and bacterial growth and infection. In Michigan, at least five different pathogens can cause blossom blight: *Phomopsis vaccinii* (Phomopsis twig blight), *Botrytis cinerea* (Botrytis blossom blight), *Colletotrichum acutatum* (anthracnose blossom/twig blight), *Monilinia vaccinii-corymbosi* (mummy berry flower strikes), and *Pseudomonas syringae* (bacterial twig blight). In addition, blueberry scorch virus and blueberry shock virus can cause blossom blight that can resemble Phomopsis twig blight. Just by looking at a blighted blossom or twigs it is difficult to identify the causal agent unless fungal growth is present, so it is a good idea to inspect the blighted tissues with a hand lens or magnifying glass.

Botrytis blossom blight, caused by *Botrytis cinerea*, is characterized by fluffy, gray to tan spores that are present all over the surface of killed blossoms. In the case of mummy berry flower strikes, a dense layer of gray powdery spores will be restricted to the flower stem or cluster stem. In general, flower strikes are much less common than shoot strikes, so it is unlikely to see flower strikes without shoot strikes. Anthracnose blossom and twig blight does not have very diagnostic features to distinguish it from Phomopsis twig blight. Pseudomonas blight is characterized by dark brown to black necrosis on the twigs. Incubation in the laboratory is necessary to identify the causal agents. Samples can be sent for diagnosis to the MSU diagnostic lab (<http://www.pestid.msu.edu/>; phone 517-355-4536. **(Editor's note:** To submit samples in MA for disease

diagnosis, contact Plant Disease Diagnostic Clinic at <http://www.extension.umass.edu/agriculture/index.php/services/plant-problem-diagnostics>).

To scout for blossom blight, walk several rows in a blueberry field and scan the bushes for symptoms. When you find any, inspect the flower clusters for twig lesions and fungal sporulation. Also be alert to the presence of insects, webbing, and insect frass, e.g., caused by cranberry fruit worm infestation. To get a better handle on disease severity and changes over time, flag five random bushes and record the number of blighted blossoms per bush every week for the next three to four weeks.

At this time, it would be good to apply a protectant fungicide that provides broad-spectrum control of blossom and twig blight pathogens. A spray of Pristine works well against most causes of blossom blight. Other options are Indar + (Captan or Ziram or CaptEvate) if you have high mummy berry and Phomopsis pressure. CaptEvate and Switch have good activity against Botrytis and anthracnose, and moderate activity against mummy berry and Phomopsis. None of the common fungicides control Pseudomonas bacterial blight, since only copper products are able to control bacterial diseases. No antibiotics are labeled for use in blueberries. Serenade (*Bacillus subtilis*) and Regalia (giant knotweed extract) may also have efficacy against bacterial blight, but have not been evaluated for that purpose in Michigan. **(Source: MSU Fruit Crop Advisory Team Alert, May 10, 2010).**

Time to Fertilize Blueberries

Eric Hanson, Michigan State Univ.

How to get the right rate and timing with fertilizer applications: Most Michigan blueberry fields need annual applications of nitrogen (N). Too little N reduces growth and yields, but too much can have similar effects, as well as wasting money and possibly impacting water quality. To be effective, use the right fertilizer at the right rate and time.

Table 1. Nitrogen Recommendations for Blueberries (lb/acre).

Age (years)	N	Urea	Ammonium sulfate
2	15	35	75
4	30	70	150
6	45	100	215
8	65	150	300

Fertilizers: Use fertilizers supplying ammonium-N, such as ammonium sulfate or urea. Ammonium sulfate is more acidifying than urea, and is the best choice if you want to reduce pH slightly. If pH is sufficiently low (below 5.0), urea may be best since it has less effect on pH. The cost per pound of N is considerably

higher for ammonium sulfate than urea. Fertilizer blends work fine if most of the N is ammonium, but calculate the

price you are paying per pound of N (not per bag of fertilizer).

Rates: General rates in pounds per acre are given in Table 1. These may be low for plants on very sand soil with low organic matter, since these soils supply relatively little N from organic matter breakdown. High organic soils and mucks may require lower rates than those in Table 1 because these soils naturally supply high amounts of available N. The best way to judge whether you are using proper rates for your fields is to submit leaf samples for nutrient analysis in the middle of the summer. This will not help this year, but will give you guidance for next season.

Timing: Blueberries absorb little N until after budbreak. Active uptake begins during bloom or petal fall, and rapid uptake and strong demand continues from this time until harvest. Apply N between bud break and bloom. This will allow N to move down into the root system by petal fall. If the soil sandy, a split application is usually beneficial; apply half between bud break and bloom and half in early

to mid June. This will help maintain available N until harvest. On heavier soils or muck soils where N does not leach as readily, a single application may be just as effective. N should not be applied to the soil after June because this may promote late flushes of growth that may not harden off adequately in the fall.

Monitoring: Collect leaf samples in the middle of the summer and have these analyzed for nutrient content. Leaf N levels will tell you whether rates for your specific fields need to be adjusted up or down. Leaf N below 1.7% indicates rates should be increased and levels higher than 2.3% mean you are applying too much. Sample at least 50 leaves from different bushes in late July to early August. Select healthy leaves from the middle of this year's shoots. If the leaves are dusty, rinse them briefly in tap water, spread them on a table top until they are dry to the touch, package them in paper bags, and send thee bags to a reputable laboratory. Leaf analysis is well worth the time and money. (*Source: Ohio Fruit ICM News, April 14, 2011, Volume 15, Issue 4*)

GRAPE

Important Sprays for Grape Disease Management

Bruce Bordelon, Purdue Univ.

Grape growth is well ahead of normal this year due to the warmer temperatures where frost damage was avoided. Grapes will soon be reaching the critical pre-bloom time period in the southern part of the state, which is a key time to control important diseases such as black rot, downy mildew, and powdery mildew. The next three or four sprays will be critical in controlling fruit infections. The rains over the past few days will increase disease pressure. Growers should pay extra attention to getting thorough coverage and use the best fungicidal materials available. The Midwest Small Fruit and Grape Spray

Guide [and New England Small Fruit Pest Management Guide] lists a wide range of products available. Use of one the strobilurins such as *Abound*, *Sovran*, *Flint*, or *Pristine* is a good option. Rotate the strobilurins with a combination of sterol inhibitor (*Bayleton*, *Rally*, *Vintage*, *Elite*, *Procure*, etc.) plus protectant (captan or mancozeb). The new combination products such as *Revus Top*, *Quadris Top* and *Adamant* should also be good for broad-spectrum disease control. These next few sprays are critical to producing sound, clean fruit . (*Source: Facts for Fancy Fruit, Vol. 12, No. 4. May 8, 2012*)

Mark The Date Of Wild Grape Bloom To Help Predict Spray Timings For Grape Berry Moth

Rufus Isaacs, and Steve Van Timmeren, Michigan State University Extension

The date of wild grape bloom is used as the biofix for running the [MSU Enviro-weather](#) grape berry moth degree day model for timing sprays against the second and third generation of grape berry moth. This is typically about a week before the primary buds of Concord vines bloom, and well before secondary buds bloom. The biofix date is when 50 percent of the wild grape clusters have 50 percent of their flowers in bloom. Samples of wild grape from different vineyards are likely to show different biofix dates, allowing you to adjust the timing of sprays later in the season for the predicted phenology of this damaging grape pest, according to the different conditions at different vineyard sites. Using this model can help take some of the guesswork out of knowing when best to make applications to protect the crop from grape berry moth.

Wild grape vines have started blooming in some areas of Berrien and Van Buren counties already. The warm weather this week is expected to bring bloom along quickly around vineyard sites with later wild grape bloom in Allegan County, and then the rest of the state in the coming days and weeks.

Once the date of wild grape bloom is set, record this date in a notebook, on the calendar or anywhere else for later retrieval. The start of the second and third generations of this pest are then predicted to start at 810 and 1,620 degree days later, respectively, using the grape berry moth degree day model that can be found online at the [Enviro-weather website](#). These typically occur in mid-July and mid-August in southwest Michigan, but with this year's warm weather, these events are likely to be early.

The predicted dates of early egg laying would be the appropriate timing for insecticides that target egg laying and young larvae such as the insect growth regulator Intrepid or the new diamide insecticides Altacor or Belt. For broad-spectrum insecticides (Imidan, Sevin, Baythroid, etc.) with the best activity on young larvae, delaying the timing of applications to 100 degree days later is recommended.

A final point on this unusual spring: As secondary clusters develop in many southwest Michigan vineyards, there are sites that have primary and secondary clusters

and others with only secondary clusters. Whatever has happened to the timing of the developing grapes, the timing of grape berry moth development this year will still be based on the degree days from wild grape bloom described above. This may result in predicted egg laying at times when cluster development is out of synchrony with the crop, but the insects are not expected to change their timing for these later clusters. (*Source: MSU Fruit Crop Advisory Team Alert, May 15, 2010*).

Managing Frost Damage: Background, Compensation, and Potential Options

Joseph A. Fiola, Univ. of Maryland

Spring frost is a significant production hazard in nearly all locations in the MidAtlantic however (luckily!) most areas of Maryland do not experience damage frequently compared to other areas. As with most issues in viticulture, **prevention or avoidance through excellent attention to site selection** is the best option to reduce risk. With that said, the following is some information on what to do when an event has occurred.

Dealing With the Damage

Previous TimelyVits dealt with deacclimation and options for reducing the hazard of frost damage. The purpose of this TimelyVit is to deal with the reality of managing a vineyard that has been damaged by frost.

- First and foremost – do not despair! – grapevines have a significant capacity to **tolerate and compensate** for damage incurred by the vine.
 - A compound (triple) bud allows multiple levels of response for the vine
 - Primary bud – full crop
 - Secondary bud – can range from 0 to 60% of “typical” full crop.
 - Tertiary bud – no crop – only vegetative survival and renewal of the vine.
 - When damage occurs, vines may compensate for reduced cluster number by increasing the number of berries set per cluster.
 - When damage occurs, vines may compensate for reduced berry number by increasing berry size.
 - Many of the hybrid varieties (including ‘Seyval Blanc’, ‘Vidal Blanc’, ‘Marechal Foch’, ‘Chancellor’, and others) possess the capacity to produce fruitful shoots from ‘non-count’ basal buds. This means that new shoots may appear from axillary buds in the cordon (typically at the base of the spur) that will have clusters to compensate for the loss of the initial primary shoots.

- There are also 1-3 (sometimes more!) clusters on each primary shoot and the less developed the cluster the more likely it is to survive low temperatures.

○ NOTE: The better your attention to open canopy management and light penetration to the buds on the shoots the previous year, the greater the flower bud initiation the previous year, the greater the number and size of clusters.

- In many cases it takes about 24 to 48 hours to actually be able to visualize the extent of the damage to the vine.

Regrettably there is not much you can do to react to the damage. A lot will depend on the extent of the damage and how the vine responds.

- There is an opportunity to try to induce the development of secondary shoots ASAP so your crop ripening will not be delayed significantly over the normal primary crop.

- If you have a variety, especially a hybrid, that may have fruitful secondaries or axillaries:

- Check the primary shoot. If the shoot tip is intact but **all of the clusters on the primary shoot are completely burned**, cut the whole shoot off to try to induce the secondary.

- NOTE: The longer the primary (12 inches or more) there is an increased risk that the secondary buds may not grow and possibly only the tertiary will develop.

- If the **clusters are intact** but there is damage to the growing tip, leave the shoot as is and let the vine compensate.

IMPORTANT NOTE: Remember, even if you think you have significant damage, DO NOT STOP YOUR CROP PROTECTIVE SPRAYS! You may have a more significant crop than you expect and if you do not protect it you will lose it to disease. (*Source: Maryland Timely Viticulture, Pre-Bloom series*)

GENERAL INFORMATION

Encouraging Beneficial Insects on your Farm

Emelie Swackhamer, Penn State Extension

Lady beetles, syrphid fly larvae, and lacewing larvae eat soft-bodied pests like aphids and scale crawlers. Some parasitoid wasps lay eggs on aphids and the developing young wasps kill their aphid host. Minute pirate bugs eat thrips and aphids. These beneficial insects and others are part of the natural fauna of your farm.

Here is link to a great fact sheet from the University of Maine that shows what some of the most common beneficial insects look like <http://umaine.edu/publications/7150e>.

I recently heard Carol Glenister of (Integrated Pest Management) IPM Laboratories talk about "Guardian" plants and how they can be used to enhance beneficial insect populations. This article summarizes some of the things I learned from her.

Many people are interested in having populations of beneficial insects inhabit their fields, high tunnels and greenhouses. One strategy is to purchase beneficial insects from a commercial supplier and release them. This is known as augmentation, and can be an effective way to manage pests. Keys to successful augmentation include properly identifying the pest, choosing a beneficial that is proven to be effective, having an adequate ratio of prey to beneficial, and following all the directions carefully. Even if you do all these things exactly right, there are no guarantees that augmentation will always work. There are so many variables that it is impossible to always get it exactly right.

If you can enhance the populations of naturally occurring beneficial insects on your farm, you may be able to get a lot of pest control with less effort. So, what can you do? Of course you want to use pesticides judiciously. Choose the least toxic pesticide possible with short residual activity. Spot spray or time your sprays to minimize contact with beneficials. What else can you do? Many beneficial insects eat nectar or pollen. Provide habitat by planting flowering plants, especially sweet alyssum, sunflowers, lantana, marigolds or fennel. Plant a row or two in your vegetable field. It is easy to do, you will probably be able to see beneficials like syrphid flies hovering over the flowers...and it is pretty too!

Researchers are working to figure out ways to encourage natural beneficials in greenhouses and high tunnels. One system involves growing "banker" plants which can support natural enemies and their prey. Briefly, the researchers grow barley in containers, and then they intentionally infest the barley plants with a cereal aphid, one that will only colonize only grasses. After the aphid population reaches a certain level, they introduce an aphid parasitoid. This parasitoid is a small wasp that lays an egg on the cereal aphid and the developing young wasp kills its aphid host. The young wasp pupates inside the dead



"mummified" body of the aphid, and emerges as an adult wasp in several days, and the females will seek out other aphid hosts. This gives greenhouse growers a portable "bank" of pupating aphid parasitoids that can colonize and kill the aphids on broadleaf host plants, such as annual bedding plants or vegetable transplants. Here is a link to a fact sheet from University of

Massachusetts, which describes the aphid banker plant system and how you can produce banker plants yourself:

<http://extension.umass.edu/floriculture/sites/floriculture/files/pdf/AphidBankerPlantSystem.pdf>.

Researchers are also working on 'Black Pearl' peppers which will support populations of a type of beneficial minute pirate bug called Orius insidiosus. Orius will eat thrips and aphids, but can also survive on the pollen of the 'Black Pearl' pepper. Keeping a few flowering 'Black Pearl' peppers around will encourage populations of Orius to live there. To read more about one of these research projects, go to <http://www.southernshare.org/News-and-Media/Press-Releases/Exploring-Biological-Control-of-Greenhouse-Pests>.

Another interesting system is using bush beans in a high tunnel where tomatoes are being produced. Two spotted spider mite is often a problem on tomatoes in high tunnels. Bush beans are very attractive to spider mites, so bush beans planted in a tomato high tunnel can serve as a sentinel or indicator plant to monitor for the pest. When spider mites are found on the bush beans, a predatory mite can be introduced. This

predatory mite can provide biological control of the spider mites throughout the high tunnel. To read more about this system go to <http://www.bugwood.org/arthropod/day2/matteoni.pdf>.

Growers should not rely on enhancing natural enemies as their only form of pest management. These systems are intriguing, and definitely worth considering as an addition to your regular pest management strategy, but they cannot replace diligent monitoring and other interventions. Leaving a heavily infested plant in your

production area can quickly lead to a pest population getting out of control. You should have a plan, and should know your options before common pest problems arise so you can react to them.

I'm planting some 'Black Pearl' peppers and sweet alyssum this year. It can't hurt, and I am interested to see what kinds of beneficial insects I will find on them. (*Source: The Vegetable & Small Fruit Gazette, Vol. 16, No. 5, May 2012*)

Wild Pollinators of Eastern Apple Orchards and how to preserve them

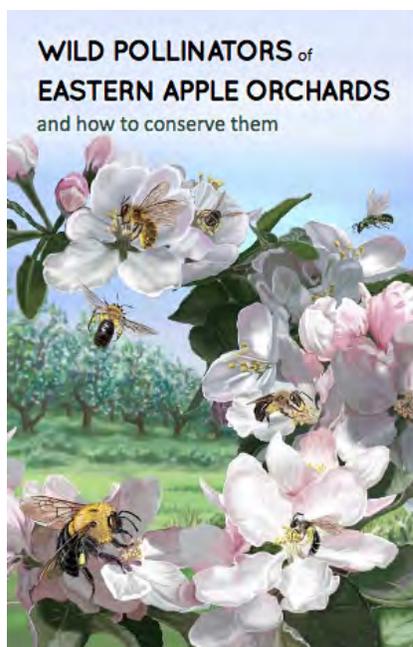
*Mia Park, Bryan Danforth,; John Losey, Arthur Agnello, Cornell University of Massachusetts
David Biddinger, Edwin Rajotte, Penn State University;
Mace Vaughan, Jolie Dollar, The Xerces Society*

New publication:

[Wild pollinators of eastern apple orchards and how to conserve them \[1.5 MB .pdf\]](#)

Learn to identify wild pollinators, how to provide them with food and habitat, and avoid pesticides that are toxic to them.

There is no doubt that insect pollination is a vital service for agricultural systems. Without insect pollinators, roughly a third of the world's crops would flower, only to fade and then lie barren. Pollinators ensure abundant fruits and vegetables. Of all insect pollinators, bees are the most important. In the US alone, the value of pollination services by bees is estimated to be \$18 billion, but these services are threatened and finding alternatives is crucial for long-term pollination success.



Effects of Water Quality on Pesticides

Bruce Bordelon, Purdue Univ.

Water quality has a profound impact on the performance of pesticides used by fruit growers. Purdue Pesticides Program recently published a very nice guide, The Impact of Water Quality on Pesticide Performance PPP-86, available at the Education Store, 1-888-EXT-INFO or www.extension.purdue.edu/store/. I highly recommend this guide to all growers.

Fruit growers often apply a post-emergent herbicide beneath the tree or vine row in spring to control winter annuals and other weeds. A pre-emergent herbicide may be included in this application. Glyphosate

(Roundup) is the most common post emergent systemic herbicide used in fruit crops. In order for glyphosate to be effective, it needs to be absorbed into the weed plant. In soft water weeds readily absorb glyphosate. However in hard water glyphosate will be 'tied up' and not absorbed as readily. Hard water, common in many parts of Indiana, contains high concentrations of soluble salts, calcium and magnesium. When these cations are present they react with the negatively charged glyphosate to form compounds that are not readily absorbed by plants. This results in poor uptake and poor weed control.

The solution to the hard water problem is to add ammonium sulfate to the spray water before mixing with glyphosate. Ammonium sulfate ions tie up the calcium and magnesium ions forming conjugate salts. Additionally, some of the glyphosate reacts with ammonium to form a compound that some weeds preferentially absorb. Sprayable ammonium sulfate is available in granular and liquid formulations. Follow the label recommendations on the amount of ammonium sulfate to add.

Another problem associated with spray water quality is that many fungicides and insecticides break down

quickly in high pH water. Captan, Imidan, malathion, and Omite are examples of compounds that are especially vulnerable to alkaline hydrolysis. Both the Midwest Tree Fruit and Small Fruit and Grape Spray Guides have a discussion of spray tank pH. Spray water can be acidified by adding a specific acidifiant, or with food grade citric acid. About 2 ounces of food grade citric acid per 100 gallons of water will lower the pH from about 8.0 to about 5.5. (**Source:** *Facts for Fancy Fruit, Vol. 12, No. 4. May 8, 2012*)

UPCOMING MEETINGS:

May 16, 2012 - *Diversified Vegetable Production and Marketing at Jericho Settlers' Farm*, 22 Barber Farm Road, Jericho VT. 3:00 – 6:00. Questions? [Vern Grubinger](mailto:Vern.Grubinger@uvm.edu), UVM Extension 802-257-7967x303 vernon.grubinger@uvm.edu

May 15, 16, 17, 2012 – *Fruit Twilight Meetings*. 5:30 – 7:30 Locations: below

Tuesday, May 15 – Apex Orchard
153 Peckville Rd., Shelburne Falls,
MA
413-625-2744
Host: Tim Smith

Wednesday, May 16 – Carlson
Orchards
115 Oak Hill Rd., Harvard, MA
800-286-3916
<http://www.carlsonorchards.com>/Host
t: Frank, Bruce and Robert Carlson

Thursday, May 17 -- Noquochoke
Orchards
594 Drift Rd., Westport, MA
508-636-2237
<http://www.noqorchards.com/>
Host: George and Sue Smith

NOTE: May 17 Meeting in collaboration with Rhode Island Fruit Growers' Association -- Rhode Island growers are encouraged to attend. Come a little early (5 PM) for clambake...

Special guest speaker Win Cowgill, Rutgers Cooperative Extension

Tree fruit twilight meetings start promptly at 5:30 PM.

1 (one) pesticide recertification credit will be offered.

There will be a \$25 meeting admission charged at the door. (\$20 for Massachusetts and Rhode Island Fruit Growers' Association FULL members.)

A light meal or snack will be served at all meetings.

For more information, call Jon Clements: 413-478-7219 or email Clements@umext.umass.edu

May 24, 2012 - *Drip irrigation twilight meeting*, Brookdale Fruit Farm, 38 Broad St, Hollis NH., 5pm – 7:00 pm, Call to confirm 603 465 2240.

June 4th, 2012 - *Growing BLUEBERRIES @ Coonamessett Farm w/ Stan Ingram, farm manager*. Coonamessett Farm, 277 Hatchville Rd., East Falmouth MA. Co-sponsored by SEMAP and NOFA-MA. Over the past 4 years Stan has worked creatively to increase the health and productivity of their 1-acre blueberry patch, including incorporating fowl, irrigation and OMRI approved sprays. \$20 **For more information or to register go to:**

June 7, 2012 – *Massachusetts Farm Winery Association Summer Twilight Meeting*. 5-8:00. Coastal Vineyards, 61 Pardon Hill Rd South Dartmouth, MA 02748. Featured **Speaker**: Dr. Wayne Wilcox, Cornell Univ. who will be speaking about “Early Season Disease Management”. 1Pesticide Credit awarded. For more information contact Kim LaFleur at masswinery@gmail.com or visit www.newenglandwinegrapes.org.

June 11, 2012 – High Tunnel Meeting. Flatts Mentor Farm, Seven Bridge Rd. Lancaster, MA. Time TBA. For details go to <http://extension.umass.edu/vegetable/events>.

June 23, 2012 – *Massachusetts Cultivated Blueberry Grower's Association Summer Meeting*. Fox Hill Farm 755 Pleasant St. Paxton, MA 01512 12:00pm picnic lunch (pyo), 1:00 program starts. Featured Speaker: Rich Cowles, CT Ag Experiment Station on Spotted Wing Drosophila and other Blueberry Pests. For more information contact Elisabeth Patt at eap1226@verizon.net.

If you know of an event that would be suitable for this list, please forward to sgs@umext.umass.edu

Massachusetts Berry Notes is a publication of the UMass Extension Fruit Program, which provides research based information on integrated management of soils, crops, pests and marketing on Massachusetts Farms. No product endorsements of products mentioned in this newsletter over like products are intended or implied. UMass Extension is an equal opportunity provider and employer, United States Department of Agriculture cooperating. Contact your local Extension office for information on disability accommodations or the UMass Extension Director if you have complaints related to discrimination, 413-545-4800.