

# Berry Notes

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Prepared by the University of Massachusetts Fruit Team

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Massachusetts Berry Notes Underwriters:



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## Message from the Editor:

**Strawberry** renovation continues. Keep renovated fields as well as new plantings regularly irrigated. Fertilization is important now. See last weeks Berry Notes for details on the renovation steps. Check new fields for evidence of potato leafhopper burn and evaluate older fields for the level of foliar diseases. This weeks issue contains information on leaf tissue testing which is an important activity after renovation. **Highbush Blueberry** harvest is underway. Send in leaf tissue samples for nutrient testing. This is especially important for blueberries since soil tests are not a reliable check on adequate nutrition. Controlling bird feeding in blueberries is an annual challenge and is discussed in detail below. Also, be sure to keep you blueberries well watered during the coming weeks to help bushes sustain their fruit-load and go into the winter free from water stress. **Summer raspberry** harvest is also underway. Intermittent rain can cause increases in fruitrot during harvest. See below for management recommendations. Be on the lookout for Orange Rust on black raspberries and blackberries. Also keep an eye out for symptoms of fireblight in raspberries. **Grape** clusters are sizing up. Scouting for disease and insect levels and taking corrective action are important activities before bunch closure. More on this below. Leaf pulling and cluster thinning are helpful to suppress disease potential. Mite infestations can build up quickly at this time of year. Be sure to check the underside of your leaves. **Currants and Gooseberries** are being harvested. Yields are very good with good quality. Some Gooseberry cultivars have suffered fruit drop from the heat of a couple of weeks ago. Some foliar diseases are evident now and should be controlled. Two-spotted spider mites may also be building up.

## Environmental Data

The following growing degree day (GDD) and precipitation data was collected for the one-week period from June 23 through July 6, 2005. Soil temperature and phenological indicators were observed on June 22, 2005. Accumulated GDDs represent the heating units above the 50° F baseline temperature collected via our instruments since the beginning of the current growing season. 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	2005 GROWING DEGREE DAYS		Soil Temp (*) (°F at 4" depth)	Accum. Precip (*) (2-Week Gain)
	2-Week Gain (*)	Total accumulation for 2005 (*)		
Cape Cod	258 (281)	1,005 (1,296)	72° (72°)	0.75" (0.25")
Southeast	289 (270)	1,153 (1,335)	80° (70°)	0.90" (0.40")
East	299 (275)	1,149 (1,360)	n/a° (70°)	n/a" (2.75")
Central	294 (277)	1,152 (1,355)	65° (64°)	5.63" (4.38")
Pioneer Valley	311 (273)	1,298 (1,411)	76° (65°)	2.76" (2.76")
Berkshires	295 (252)	1,198 (1,321)	79° (68°)	3.59" (1.79")

\*Data from same week in 2004. (Source: UMass Extension Landscape Message #19, July 22, 2005)

## STRAWBERRY

### Strawberry Update

Sonia Schloemann, UMass Extension

**Fertilization:** You will be fertilizing your bearing fields with 25-60 lbs. N/acre as part of the renovation process, but new plantings will benefit from a fertilizer application now, too. 30 lbs of actual N per acre is the amount to apply. 200 lbs of 15-15-15 is one possibility, but 90 lbs of ammonium nitrate is fine if you applied P and K at planting. Keep applying N at monthly intervals until you've put on a total of about 100 lbs of actual N.

#### Leaf Tissue Sampling:

Leaf tissue analysis is a way of determining the actual nutritional status of plants. It is an excellent and inexpensive way of finding out if your fertilization program is working or if changes need to be made. The analysis provides information on foliar N, P, K, Ca, Mg, Mn, Fe, Cu, B and Zn levels for the leaves sampled and recommendations for corrective measures if needed. Combined with soil testing, leaf tissue analysis can help pinpoint the source of problems and determine what measures may be needed to ensure proper nutrition of the crop. For strawberries sample from the first fully expanded new leaves after renovation. Collect 30 - 50 leaves per sample. Sample different varieties separately, if possible. Collect leaves from as many plants as possible in the sample area.



**Figure 1:** Characteristic leaf yellowing and curling caused by potato leafhopper. similar injury occurs on raspberry. Photo by Pam Fisher, Ontario Ministry of Agriculture and Food.

Remove the petioles (leaf stems) from the leaves. Gently wash the leaves in tap water to rinse off soil or spray residue. Allow the leaves to air dry until they are brittle before placing into a paper bag. The cost per sample is \$18. A check made out to the University of Massachusetts must be sent in with the sample. Send sample(s) to the Soil and Plant Tissue Testing Lab, West Experiment Station, Box 38020 UMass, Amherst, MA 01003 or call (413) 545-4768.

Test results will be accompanied with recommendations.

**Potato leafhopper:** Check new plantings now for potato leafhopper (*Empoasca fabae*) damage. Leafhoppers feed primarily on the underside of strawberry leaves, causing them to yellow between the veins and become curled and distorted. Feeding activity is most serious during the late spring and early summer. Leafhoppers are 1/8 inch long, green, bullet-shaped insects that take flight quickly if disturbed. The nymphs are light green and do not fly. Nymphs are easily identified by their

habit of moving sideways when disturbed. Insecticides should be applied only when large populations of nymphs are noted on the leaves or symptoms become apparent. (Source: Reprinted from Massachusetts Berry Notes, Vol. 16, No. 11 2004)

## Summer Management of Foliar Diseases of Strawberry

Bill Turechek, formerly of Cornell University, currently at USDA Beltsville

In this month's issue of the NY Berry News we will cover foliar disease management on strawberry. Foliar diseases are often overlooked because most do not become noticeable until after harvest or renovation. However, serious outbreaks of any of the diseases discussed below can seriously impact the vigor, winter hardiness, and even the production of a planting. At this point, it is not well understood when is the most critical time to manage disease or how much foliar disease can a strawberry planting tolerate. We are currently

researching these questions with support from the North American Strawberry Growers

Association and the New York IPM Program. Until we have a better understanding,

though, we currently work under the assumption that severe infection in the summer (greater than 30% disease) is enough to impact the health of the plant and possibly result in the damage discussed above (this is based on some preliminary

work done in my lab). In problem fields, I suspect that one or two well-timed fungicide applications in the summer months may be all that is needed to keep disease from reaching levels that may impact production.

**Leaf spot** is caused by the fungus *Mycosphaerella fragariae*. It is one of the most common and widespread diseases of cultivated strawberry. It is also the cause of black seed; a disease of the fruit that can occur when warm and wet conditions occur during bloom. Prior to the development of resistant cultivars, leaf spot was the most economically important disease of strawberry. However, since many commercially grown cultivars are not completely resistant to leaf spot, this disease is still

significant on a number of cultivars including 'Honeoye', 'Idea', 'Marmolada', 'Raritan', 'Kent'.

**Leaf scorch** is caused by the fungus *Diplocarpon earlianum*. It is a common disease of strawberry throughout the northeast. Epidemics occur normally from August to October. Leaf scorch can markedly reduce vegetative growth, weakening plants and resulting in a sharp reduction of growth of shoots and roots, a reduction in the number and vigor of crowns, and quite possibly fruit yield. Severely

infected plants may die

from environmental stresses, such as heat, cold or drought. Like leaf spot, losses vary depending upon cultivar susceptibility.

**Leaf blight** is caused by the fungus *Phomopsis obscurans*. The disease affects primarily older foliage in late summer and, like leaf scorch, can result in reduced plant vigor and yield in the following season. (It also can cause severe defoliation in nursery production areas in the southeastern US.) Leaf blight is particularly destructive to slow-



growing or weak plants. It seldom damages young, runner plants, and rarely attacks the fruit in the Northeast like it does in the South. The spread of *P. obscurans* is favored by frequent rains, overhead irrigation, and heavy dews. Little spread occurs during hot, dry weather in the summer, although symptoms may continue to develop during this period.

**Powdery mildew** is caused by the fungus *Spaerotheca macularis*. Disease severity is most pronounced in areas that experience high humidity and moderate temperatures through the growing season, such as the coastal and Great Lakes regions of the US. Like most of the foliar diseases mentioned, severe outbreaks of powdery mildew can weaken plants leading to an increase in winter-injury and a

reduction in yield. The disease has been prevalent after renovation in plantings in Geneva the past few years.

**Angular leaf spot** is caused by the bacterium *Xanthomonas campestris* pv. *fragariae*. In New York, it doesn't appear the disease is as widespread as the others addressed so far. The disease severely affects the foliage, and has the potential to attack the calyx

(i.e., the sepals on fruit) or the crown of the spot pathogen was isolated from a number of fruit calyxes showing the symptoms of "brown cap". How prevalent this is across NY, and whether this organism was the primary cause or secondary invader has yet to be determined. Nonetheless, the disease is often left uncontrolled (mainly because there are no real control options) and, seemingly, this has little impact on the planting the following year.

**Management of foliar diseases:** Once the leaves begin to regrow after renovation, there are a number of options growers have to effectively manage disease. Nova 40W is labeled for control of leaf spot, leaf blight, and powdery mildew and is a very effective against these diseases; I have not seen data to

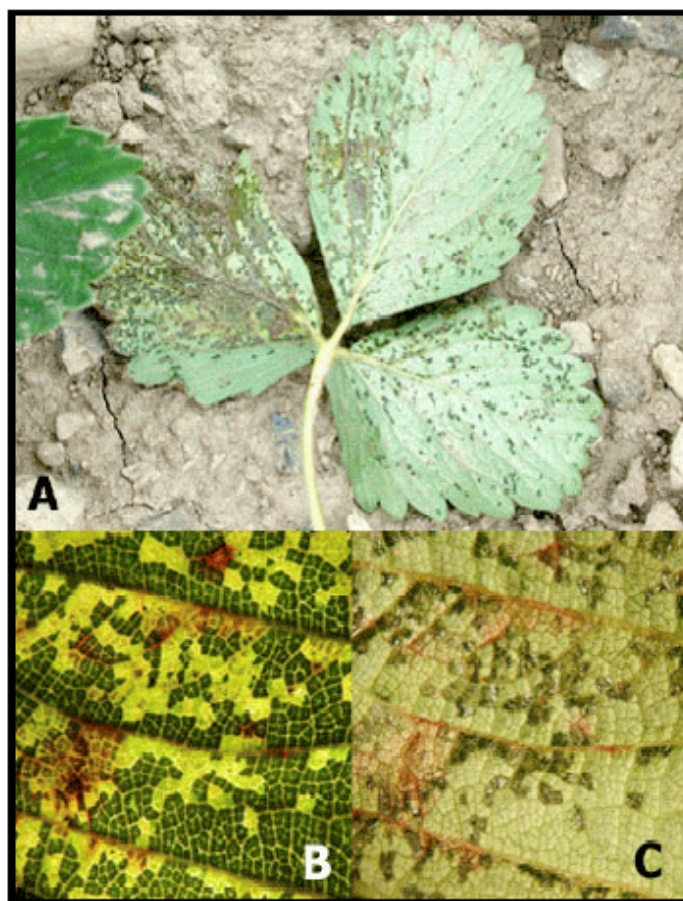
support its efficacy against leaf scorch. Applications should begin when disease appears and continue on a 14 to 21 day

schedule or, better, when conditions favor disease development. Often, the first application can wait until after harvest. If disease pressure was serious prior to renovation, growers should make a note to consider beginning treatment before renovation next year. If repeated applications are necessary, it is recommended that

Nova 40W be alternated with a tank mix of Topsin- M plus Captan. If anthracnose fruit rot was (or has been) a problem, growers should use a fungicide that also has activity against this disease, such as Captan or Quadris. The fungus is capable of attacking the petioles of young leaves as they emerge after renovation. Fungicide applications at this time serve to protect the leaves from attack and reduce the pathogen population that can overwinter and cause outbreaks next season. Quadris has good activity against anthracnose and powdery mildew. In trials conducted in Ohio, Quadris was shown to have excellent activity against leaf blight as well. Captan will have good to excellent activity against anthracnose as long as coverage is maintained. Fixed copper products are the only real option for managing angular leaf spot. Copper can be applied on 14-21 day schedule, but growers



Powdery mildew symptoms on underside of leaf. Fruiting bodies of the fungus can be seen towards the end of the summer (right picture).



(A) Symptoms of angular leaf spot on the underside of a leaf; (B) as they appear under transmitted light, i.e., leaf held towards the sky; and (C) from reflected light, i.e., leaf looked at from above.

should be aware that as few as 3 successive applications of copper can result in phytotoxicity on some varieties, quite possibly doing more damage than disease itself. The collective experience of many small fruit pathologists in the Northeast is that treatment is often not necessary, as this disease can appear in epidemic from one year but often not the next.

Lastly, a number of cultural practices can be used to help manage disease. New plantings should be established in sites with light, well-drained soil, with

good air circulation and full exposure to the sun. In matted-row systems, runner plants should be carefully spaced when filling rows and the entire planting should be kept free of weeds to improve air circulation and reduce drying time for leaves. Removing and burning all debris at renovation (after harvest) helps to reduce overwintering inoculum of all leaf pathogens. (*Source: New York Berry News, Vol. 13, No. 7, July 2004*)

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## RASPBERRY

### Battling Botrytis in Fall Raspberries

*Annemiek Schilder, Michigan State University*

Botrytis gray mold, caused by the fungus *Botrytis cinerea*, is one of the most important diseases affecting fall raspberries. Fall raspberries are usually at greater risk of infection than summer raspberries because of the prevailing weather conditions, such as lower temperatures, heavy dews and frequent precipitation. Cool, wet weather is conducive to development of the fungus and infection of the fruit. If the weather remains similar to what it has been, Botrytis will be problematic in raspberries this year.

#### Symptoms

Typical symptoms include a brown discoloration of the fruit and the presence of a gray fuzzy mold, which can rapidly develop and spread to neighboring healthy berries. Symptoms tend to be more severe inside the canopy and on clusters that are closer to the ground. Even if berries look perfectly healthy at harvest, they can change to a moldy mass within 24 to 48 hours.

#### Biology of the fungus

*Botrytis cinerea* is a ubiquitous fungus, which is able to grow and sporulate profusely on dead organic matter. It overwinters in old infected canes and plant debris. The spores are airborne and can travel long distances in the wind. When the spores land on plant surfaces, they germinate and can invade the plant tissues directly or through wounds. Production of spores and infection are favored by prolonged periods of wetness or high humidity and moderate temperatures (60-75°F). When wet conditions prevail during the bloom period, withering flower parts may become infected by the fungus and lead to latent infections of the young berries. Such infections become active as the berries ripen. Overripe berries and bruised berries are particularly susceptible to infection.

#### Control

Cultural methods are very important for control of Botrytis gray mold. Choosing a site with good airflow can reduce humidity in the canopy considerably. Low-density plantings/narrow rows and trellising can also reduce a buildup of humidity. Good weed control and moderate use of fertilizer to avoid lush growth are also important. Selecting a resistant cultivar or, at a minimum, avoiding highly susceptible cultivars will help to reduce the need for control measures. During picking, avoid handling infected berries, since spores can be transferred on hands to healthy berries. Timely harvesting and rapid post-harvest cooling can also help to reduce losses to Botrytis gray mold. Several fungicides are labeled for control of Botrytis in raspberries. Fungicide sprays during bloom are important to prevent pre-harvest infections, while postharvest infections can be reduced by spraying close to harvest. Several efficacious fungicides are available: Elevate (fenhexamid) is a reduced-risk fungicide with locally systemic properties. It has a 0-day PHI and provides good control of pre- and post-harvest gray mold. Switch (cyprodinil and fludioxonil) is a recently registered fungicide with protectant and systemic properties. It has also performed well in raspberry trials in Michigan. Switch has a 0-day PHI. A maximum of four sprays (and two consecutive sprays) is allowed for both Switch and Elevate. Switch and Elevate are in different chemical classes and may be alternated with each other or with Captan [not in MA], Rovral, or Nova to reduce the risk of resistance development. (*Source: Michigan Fruit Crop Advisory Team Alert, Vol. 18, No. 13, July 15, 2003*)

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## BLUEBERRY

### Prevention of pre- and post-harvest fruit rots in blueberries

*Annemiek Schilder, Michigan State University*

As harvest is upon us, take note of the pre-harvest interval (PHI) for the various fungicides. Most fungicides that you would use at this time of the year have a 0-day PHI, but Topsin M has a 7-day PHI. Blueberries may benefit from applications of fungicides for fruit rot control close to the first harvest and even between harvests, since anthracnose rot incidence can increase greatly at the later harvests.

The main diseases of concern at this time of the year are fruit rots, such as anthracnose (orange wet spore blobs) and *Alternaria* fruit rot (green velvety layer of spores). *Botrytis* fruit rot (gray mold) is usually not a problem in Michigan, but can occur, especially in wet years. Anthracnose is often a problem in cultivars such as Bluecrop, Jersey and Rubel, while *Alternaria* fruit rot is more common in Bluecrop. Elliott is moderately resistant to anthracnose. While fruit rot is usually not visible until the berries ripen, it is prudent to assume you will have a fruit rot problem if you had problems last year. If the first blueberries are starting to show rot, fungicide sprays can limit new infections of neighboring healthy berries. Often, these berries look healthy at harvest, but start to rot soon after in the lugs while awaiting processing. Rot may be slowed down by refrigerated storage, but will resume on the supermarket shelves, lowering fruit quality. Applications close to the first harvest or between harvests can still be beneficial

in preventing these late infections. In fact, an application between the first and second harvest may be recommended as well under high disease pressure.

The strobilurins (Abound, Cabrio, Pristine) are all highly effective against anthracnose, with Pristine having the most broad-spectrum activity since it contains two different active ingredients. However, it probably is also the most expensive of the three. Pristine will also have excellent activity against *Phomopsis*, while Cabrio has good and Abound fair activity against this disease. All have moderate to good activity against *Alternaria* fruit rot and become quickly rainfast since they are locally systemic. Switch (cyprodinil and fludioxonil) also has some systemic properties and provides simultaneous control of anthracnose, *Alternaria* and *Botrytis* fruit rots. Thus it may be a good choice if several fruit rots are a concern, e.g., in 'Bluecrop.' Aliette (fosetyl-AI) is a highly systemic fungicide that provides good control of anthracnose, *Alternaria* fruit rot and *Phomopsis*. Of course Topsin plus Captan can still be used, provided the 7-day PHI of Topsin is taken into consideration. While Topsin is very active against *Phomopsis*, Captan will do most of the work against anthracnose. Therefore, if anthracnose is the disease you wish to control, a Captan or Captec spray alone may suffice. Just remember that Captan is a protectant that can be washed off in heavy rain. As such, it also does not provide any post-infection activity. (*Source: Michigan Fruit Crop Advisory, Vol. 20, No. 13, July 12, 2005*)

### The Blueberry Bird Problem: Options for Control

*Marvin P. Pritts, Cornell University, Ithaca, NY*

Birds are a major pest of fruit crops such as cherries, blueberries and some grape varieties. In a recent survey, blueberry growers in the northeastern United States estimated that nearly 30% of their crop is lost to bird depredation. Across the country, 10% of the blueberry crop is probably lost - at a cost of \$10 million. Since the loss of Mesurool, no effective chemical repellent has been available. Netting is expensive and difficult to install, so most growers would like to avoid using it if possible.

For the past several years, with the cooperation of Paul Curtis, wildlife management specialist in the Department of Natural Resources, we have been examining the effectiveness of chemical repellents and audio scare devices for birds in blueberries and cherries. What follows is a summary of our experiences with these new technologies.

**Chemical repellents.** Methyl anthranilate is chemically similar to the major flavor component of Concord grapes, and is manufactured in large quantities by food processors. Birds are repelled by its taste, and since it is generally regarded as safe for human consumption by the FDA, it would seem to be a viable alternative to Mesurool. This product is now registered for use in blueberry plantings (Bird-Shield and Rejex-It). However, we have found several problems with this material. First, it is a volatile compound and has a short residual on exposed fruit. We have found good repellency for about 3 days, but the material loses its effectiveness later. Similar results have been reported from Oregon and Florida. Second, to repel birds, a large amount must be consumed in one bite. It is less effective when applied uniformly as it would be with an air blast sprayer. Although methyl anthranilate works well as a goose repellent in turf, our expectation is that these formulations

will not be widely used in fruit plantings until further improvements to the formulation are made.

**Sugar.** Applications of sugar syrup have been shown to repel birds from blueberry plantings. The exact mechanism of repellency is unknown, but may relate to the inability of many bird species to digest disaccharides. (Most bird-dispersed fruits contain simple monosaccharide sugars.) The sugar is applied when the fruits begin to turn blue, and reapplied after episodes of rain. We dissolved 230 lbs of sugar in 21 gallons of hot water, yielding 40 gallons of solution. Olympic Spreader Sticker was added at 310 ppm. Birds damage was 50% less where sucrose was applied. Although each treatment cost \$40 - \$50 per acre, and we applied sugar 4 times during the season, the total expense (\$160) was far less than the losses to birds that an adjacent field experienced. In field trials, the sugar also repelled birds, although an increase in Japanese beetles and yellow jackets was observed in treated plots.

**Audio scare devices.** Distress tapes, cannons and firecrackers are audio devices to which birds rapidly acclimate. They are effective for only short periods of time unless moved regularly and supplemented with visual scare devices. Recently, a new electronic device named "Bird-Gard" has been developed with digitized, species specific bird distress calls. The device we tested emitted distress calls of crows, robins and starlings every minute during daylight hours. We tested the device in two blueberry fields with high bird pressure, and found it to be effective for about 7 to 10 days. In one field, we added hawk models after a couple of weeks and observed a reduction in feeding. When the device was turned off, feeding increased dramatically. A new version of the Bird-Gard includes a shriek of a

hawk prior to the distress calls, and elicits calls randomly. These modifications seem to enhance the effectiveness of the device.

Even though feeding by certain bird species was reduced, many birds still fed in the plantings, especially ground-feeders like sparrows and finches. Because blueberries ripen over such a long period of time, the birds have ample opportunity to habituate to the sounds.

Furthermore, species composition changes over time, so sounds that work early in the harvest may not work at the end of the season. One blueberry grower reported that an owl model was very effective for him. The owl mounts on a bearing on top of a post, allowing the owl to swivel in the slightest breeze. In addition, the owl emits a loud shriek at intervals, powered by a solar cell. Combinations of audio and visual scare devices seem to be most effective.

**Others.** We have surrounded a planting with strobe lights, but found they were not effective. We also tested "Bye-Bye Birdie" - a device from Japan that looks like a bird, but contains a powerful magnet purported to disrupt the natural sense of direction of birds, which they purportedly avoid for distances up to 70 ft. After hanging many of these magnets over a blueberry field, we found them to be ineffective. In addition, we tested a special machine that laid out a sprayable "biodegradable" netting. It is effective on vegetable crops for insect control, and seemed to have potential for blueberries as well. However, the application was too slow and likely to be uneconomical. **Bottom line:** Combinations of visual and audio scare devices with taste deterrents are the most practical substitute for netting at this time. (*Source: New York Berry News, Vol. 13, No. 7, July 2004*)

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## GRAPE

### Long Island Grape Update

*Alice Wise, Cornell Cooperative Extension*

Miticide Options For Winegrapes: With the mite season approaching, now is a good time to review miticide options. Our main options include Acramite, Agri-Mek, Danitol, Kelthane 50WSP, Vendex, horticultural oil and insecticidal soap. Pyramite (now called Nexter) is not labeled for use on Long Island. There are a few unconventional products such as EcoTrol and Hexacide, which probably work much like oils. Acramite, Kelthane and Vendex have all performed about equally in an LI trial for European red mite (ERM).

Field experience suggests that the efficacy of Kelthane and Vendex varies, possibly due to resistance. With Acramite, be sure spray water pH is below 7 and hardness levels are low (not usually a problem on LI),

or add a conditioner (manufacturer suggests Choice or ReQuest). Spray water pH for Kelthane should also be below 7. Note that water tested at LIHREC has been around 6.0- 6.5. Your well water may be different however. Vendex is restricted-use and benefits from good tank agitation. Agri-Mek is labeled for twospotted mite (though it provides control of ERM also) and will work best on tender growth (i.e. best use is in early summer rather than late summer). Foliar penetration and residual control will be improved by addition of 0.25% horticultural oil to the mix. Agri-Mek has 'translaminar' activity (moves into the leaf) but use against twospots later in summer may be primarily as a contact miticide. There have been good results with Danitol; although it probably has the greatest impact on beneficial mite predators. We haven't yet had reports of mite resurgence sometimes seen with use of pyrethroids. Since

resistance to miticides is a real possibility, users should rotate among products; most labels restrict the numbers of applications per year. Some growers have experience with JMS Stylet Oil; excellent coverage is essential for control of ERM. Stylet Oil will knock back but not control a raging infestation. We haven't had experience with the insecticidal soaps (MPede or Olympic) on grape, although results in greenhouse trials with twospotted spider mite have been fairly good. Be sure to check soap and oil labels carefully for cautions concerning application with or close in time to certain fungicides or other materials and during stressful conditions. Note that Acramite is a reduced risk product while JMS Stylet Oil (organic formulation), Hexacide, Ecotrol and M-Pede are the organic options.

#### Product details

- **Acramite** 0.75 - 1 lb/acre rate, 12 hr. reentry, 14 days PHI, one application/season, 2(ee) for ERM use spray water pH<7

- **Agri-Mek** 8 - 16 fl oz - 12 hrs. - 28 day PHI, max 2 app/season, at least 21 days between applications.

- **Kelthane** 50WSP - 2.5 lb/a rate - 48 hr. reentry - 7 day PHI -use spray water pH<7, max 2 app./year

- **Vendex** 1 - 2.5 lb/acre rate - 24 hr reentry - 28 day PHI - min 21 days between applications, restr.-use, Max. 2 app & 4 lb/A/year

- **Danitol** 10.7 fl oz/acre rate - 24 hr. reentry - 21 day PHI - max 2 app/year recommended

- **JMS Stylet Oil** 1.5 % - 4 hr. reentry - 0 day PHI - Avoid mixing with or applying soon before or after some pesticides esp. sulfur (see label).

*Rentry = reentry interval; PHI = preharvest interval*

\*see labels for additional restrictions

*(Source: Long Island Fruit & Vegetable Update, No. 18, JULY 15, 2005)*

### Bugs in the Vineyard

*Mark Chien, Penn State Univ.*

Know your enemy! I suggest getting a copy of the Pocket Guide for Grape IPM Scouting in the North Central and Eastern U.S. (<http://www.ipm.msu.edu/GrapePocket.htm>). If you know what to look for, it sure helps in finding it. Then start with a sound strategy. Don't just spray without thought or a plan. Insecticides are nasty. Minimize their use. They have troubling side affects. And resistance is always a concern. Managing insect pests takes great skill and attention to detail, more so than fungal diseases and the stakes are just as high.

There seems to be no end to annoying bugs in the vineyard. This year started out with an infestation of flea beetles an more recently the Japanese beetles have been particularly bad. With the warm weather we are having, I worry about Grape Berry Moth, particularly late season damage that can create openings for botrytis and other secondary rot organisms, which have been problematic in the past two wet vintages. While I only heard a few reports of the Multicolored Asian Lady Beetle (malb) in SE PA, it was a problem in MD, NY and other points north and can be a threat to our wines in Pennsylvania. *Harmonia axyridis* was introduced in the US to help control soy bean aphids. They have done a splendid job of that. Unfortunately, once the target pest is gone, they move to other crops, in our case, into grape clusters as an initiation into overwintering mode for the insect. Once there, they are very difficult to dislodge and because this often occurs just before harvest, chemical options are limited. While unverified, it is reported that just 3-4 bugs per lug of

fruit (30-40 lbs) can end up tainting the wine with isopropyl-methoxypyrazine, oddly, one of the chemicals in red wine grapes like Cabernet Sauvignon that can lead to unpleasant descriptors such as bell pepper and asparagus. According to Hartman (2003), the isopropyl form can leave a potato smell in wine. Other descriptors include peanut, earthy and herbaceous and bitter as well as a loss of varietal character. The hemolymph or blood is a natural protectant to make it unattractive to birds and other predators (Williams, 2005). This chemical will release into the juice and remain intact downstream in the wine making process. It is particularly damaging to white wines like Chardonnay and Pinot Gris. The control options are still being explored with suppression and repelling being the main strategies. Everything from camphor and menthol to oils and kaolin clays have been tried along with the usual insecticides. Sorting, dunking and vacuuming have also been tried. All with limited success or feasibility. This is a very complicated, late season problem.

MALB hit hard in Ontario in 2001 and was present again last year. As a result, the folks up there probably have more experience with the insect than anyone. Kevin Kerr is a consultant and extension-type agent with Brock University and has written a wonderful brief on malb. I have included the article in an attachment. If you want to know your enemy before it strikes, you should read this. There is no certainty that malb will be a harvest issue in Pennsylvania this year, but it should be considered a potential threat to wine quality.



Japanese beetles are an annual thorn in the side of grape growers. Some years are worse than others and this is a bad one. Yes, I know it's really too late to be talking about JB's, but I'm worried because I have talked to growers who are spraying insecticides on a regular basis and this is not desirable for many reasons. Broad spectrum insecticides like Sevin will kill much of the beneficial population of insects and mites in the vineyard and may cause other insect/mite problems to flare. Lake Erie growers are experiencing resistance problems with Sevin, so overuse can compromise the future use of carbaryl in your vineyard. As you know from the label, insecticides are among the most environmentally and health adverse chemicals used in agriculture. Keeping them in their containers is the best thing a grower can do. The beetles emerge from the ground in late June through July and feed on soft, thin foliage, usually found at the outer portions of the shoots. The weblike remains of foliage that remain are distressing to look at, yet vines can sustain considerable damage and laterals will fill back in - the OSU production guide sets the threshold of 15% damaged leaves. If you just have a few vines, shop vac the beetles off. If you are intending to spray, I suggest you orient your nozzles to the shoot tips and just spray the tips. There are a lot of ideas about how to control Japanese beetles, from oils to milky spores. I suggest the softer approach to start and if the problem persists, try the hammer. You can find a lot of good information about JB control on the web, including <http://www.uky.edu/Agriculture/Entomology/entfacts/tees/ef409.htm>.

I'm pretty sure that Grape Berry Moth is going to be problem later in the season in vineyards this year. The weather has been perfect and we will probably get a third flight this season just as the grapes are ripe and soft. Their wounds are entry points for bacteria, yeast, fungi and other bad noogies that cause rot problems that make wine making very difficult. Andy Muza, my extension colleague in Erie, has been working on a GBM risk assessment system for two years. Andy and Tim Weigle (Cornell) are also testing a pheromone trapping network to provide trap counts in high risk sites to growers in NW PA and western NY. He suggests looking for the reddish/purplish "stings" on the green fruit. Already this year in Erie they are seeing significant damage in even low to medium risk vineyards. Getting an idea now of the amount of damage will be helpful in developing a spray strategy. They set the threshold at 6% damaged clusters. We are at the tail end of the spray window for the second seasonal application. Again, know when, where and how to treat is so important. If you have low levels of GBM, you might get away with just using pheromone ties and/or sprays for mating disruption. Reports of

efficacy with pheromones to me from growers has been mixed. Another narrow spectrum treatment is *Bacillus thuringiensis* or BT, a bacteria that targets Lepidoptera. While not as effective as the usual insecticides (Sevin, Danitol, Imidan), again, in low to moderate situations it is a good option. Trade names are Dipel and Biobit. Alice Wise suggests that you open up the fruit zone and direct sprays at the fruit clusters to improve penetration. Two new product for GBM control are Spintor and Entrust. They are softer compounds derived from soil microbes and registered for use in organic applications. As expected, efficacy is not as great as the traditional insecticides and two applications are required, but in low to moderate infestations they can be a good choice. You can find the Cornell Fact Sheet on GMB at

<http://www.nysipm.cornell.edu/factsheets/grapes/pests/gbm/gbm.html>. The publication for risk assessment for GBM and grape leafhopper is at <http://www.nysipm.cornell.edu/publications/grapeman/risk.pdf>.

Finally, a word on canopy and crop management... what started out as a late and dry season has changed completely. As of July 18, my colleague Tim Martinson in the Finger Lakes reports that they are 9 days ahead of 2004 and 7 days ahead of the long term average in growing degree days. Similar reports are coming from the Lake Erie region. So maybe we caught up from a late budbreak. In June I was pretty happy because it was dry and the corn was growing slowly but in July we have settled back into our afternoon thundershower pattern. This morning, the dew point must have hit 80, it was toxic outside here in Lancaster. Dr. Travis will tell you that every night with conditions of heavy humidity and morning dew represents an infection period for powdery and downy. So extra vigilance is required. I have been hearing good reports of the general "cleanliness" of the vineyards but I have an uncomfortable feeling of what might be lurking in the canopies. This wet weather has caused the canopy growth to explode so frequent hedging and probably an extra pass of leaf and/or lateral removal may be necessary. Keep the canopy open to get the air and spray into the fruit zones and light also. Canopy density will aggravate disease problems so if you have a "fat" canopy, you should be thinking ahead to balance pruning and figuring out if you need to divide. If you are single yellowing and leaf margins are turning brown in the interior canopy, you need remedial treatment, e.g. less vigor and better balance.

Crop management is also important and we are entering a prime window to thin. We are past lag phase but you can still weigh clusters and get an idea of what final harvest weights will be. From that, you can calculate backwards to determine number of clusters to remove. I'm probably paranoid but I think we are going to push harvest dates again and get pressure from birds, bugs, disease and weather. So if good quality wine is the objective, manage

your crop judiciously. We have too many new growers to endorse the eyeball, shoot from the hip crop estimate method. Growers need data! Start collecting it now. I'm reading a rather tawdry book about Bordeaux called "Noble Rot" and between the social intrigue there are a few viticultural items of use - one being that the way all these new garagiste wine growers are making good wines, often on marginal sites, is that they lower their yields, often to half or a third of what is considered

normal. There is just something about this relationship, yield:quality, that is as true as it is ambiguous. This applies to "production" grapes as well as high end vinifera. I still argue ultimately for a balanced vine, no matter what the relative vigor, but always with a well regulated yield component. (Source: PA WINE GRAPE INFORMATION, July 27,2005)

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## General Information

### Tissue sampling to determine your fertilizer needs?

*Eric Hanson, Mark Lonstroth, Michigan State University*

It is time to start thinking about collecting tissue samples for analysis of plant nutrient levels. Tissue analysis is a valuable and usually under-utilized tool in fruit nutrition programs. Results provide a means of accurately identifying nutritional problems difficult to diagnose by soil testing or observing plant appearance. More importantly, growers can identify and correct potential nutrient shortages before growth or yield is affected.

Start dividing the farm into uniform sampling units, based on differences in soil types, past fertilization or management practices or varieties. If these factors are generally uniform, designate sampling units of up to 10 acres each. Farms on variable soils or history will require more samples to provide an accurate picture of the nutritional health over the farm. For routine monitoring, sample every two to four years. On larger farms, different blocks may be sampled during successive years on a two- to four-year cycle. If you are trying to diagnose a suspected nutritional problem, collect one sample from plants beginning to develop the problem and a second from nearby healthy plants.

The proper sampling time is between mid-July (southern Michigan) and mid-August (northern areas). Sample grapevines at veraison (fruit color change). Samples from orchards and blueberry, raspberry and strawberry plantings should consist of 50 to 100 leaves collected from different plants throughout the sampling area. Collect full-sized leaves from the middle of current-season shoots – not spur leaves. If leaves do not detach readily when pulled in a downward direction, wait a week or two and try again. Collect raspberry

leaves only from primocanes (current season canes). For grapes, collect only the petioles (stems) of the most recently matured leaves. Concord leaves turn tan on the underside as they mature. Wash the tissues by swirling them in a dilute detergent solution for several seconds, then rinse briefly in tap water. Let samples air-dry on a table top for a day or two before sending them to the lab - wet or moist leaves will rot during shipping.

Labs may offer analysis of single nutrients, such as N, but the cost of complete analyses is usually not that much more. The [MSU Soil and Plant Nutrient Lab](http://www.msusoilandplantnutrientlab.com/) (517-355-0218) provides tissue analysis and an interpretive report. Send samples to the Soil and Plant Nutrient Lab, A84 PSSB, MSU, East Lansing, MI 48824.

Some other labs offering tissue analysis include A & L Great Lakes Laboratories in Ft Wayne IN (219-483-4759, <http://www.algreatlakes.com/>) and Brookside Labs in New Knoxville, OH (419-753-2448, <http://www.blinc.com/>) [and UMass Soil and Tissue Testing Lab <http://www.umass.edu/plsoils/soiltest/>].

The cost of tissue analysis discourages many growers from regularly using this service. I think the potential savings clearly justifies the cost. A single sample (analytical costs \$20 to \$25) represents up to 10 acres, so the cost monitoring is only \$2 to \$3 per acre. Often, the results indicate that fertilizers are not needed or rates can be reduced. Identifying a nutritional problem before yields or quality are impacted can save hundreds of dollars per acre. (**Source:** *Michigan Fruit Crop Advisory Team Alert, Vol. 20, No. 13, July 12, 2005*)

## **TracBerry® Record-Keeping and Reporting Software Now Available**

*Michele Kaufman, Cornell University*

### **What is Trac Software?**

Trac is an easy-to-use software program for growers to record their yearly spray and fertilizer treatments. From the master spray data sheet, Trac automatically generates the processor report forms, Eurepgap forms, and EPA WPS Central Posting.

### **Four Trac Software CDs are available:**

- *TracApple*® – Apple and Pear
- *TracGrape*® – Grape
- *TracBerry*® – Strawberry, Blueberry, Raspberry & Blackberry, and Ribes

### **What hardware and software do I need?**

- Microsoft Excel
- CD Rom Drive
- Printer

Each CD has a comprehensive, 22-page, Trac Software Manual. Use copy and paste to move information from 2004 or 2003 into Trac 2005. As always -Trac 2005 has the latest pesticide information, based on the 2005 Cornell Guidelines.

### **How does Trac work?**

Those familiar with working on a spreadsheet will find it easy to use Trac Software, since it is written in MS Excel, a popular spreadsheet program. Very simply, the user “fills in the blanks.” There are data entry worksheets, much like sheets of paper. One sheet asks for basic grower information, such as name and address. Another sheet allows the user to enter their spray information, such as the spray date and chemical used. From the data entry worksheets, the program automatically completes the processor spray report forms.

### **Are there other benefits to using Trac?**

We think so! Trac has “drop down” lists for pesticides and pests that you can select from. This saves time and prevents typing errors. When you select a pesticide Trade Name from the drop down list the program automatically fills in the EPA registration number, REI,

PHI and calculates the earliest harvest date. The software also generates drop-down lists specific to your farm operation. And it will automatically fill out an EPA WPS Central Posting form.

### **How often is Trac updated?**

Trac software is updated on a yearly basis. This means you get the most up-to-date information on pest management materials. Trac software information is based on the Cornell Pest Management Guidelines that are updated yearly.

Trac Software was developed and written by Juliet Carroll, Fruit IPM Coordinator, and, Judy Nedrow, Trac Programmer. Carroll notes, “One of the major efforts Judy Nedrow and I worked on this past year was to develop TracBerry for strawberry, blueberry, raspberry & blackberry, and Ribes. Many thanks to those of you who helped in collating all of the pesticides for input into the software program.

I would like to highlight a new feature for 2005 in Trac Software that is particularly applicable to TracBerry. Judy and I created IPM Elements worksheets that will tally the percent of IPM Elements being practiced by the grower. These worksheets, for strawberry, raspberry, and blueberry, are included in the TracBerry software.”

Funding for Trac Software has been provided by: The New York State Department of Agriculture and Markets, The New York Wine and Grape Foundation, and the New York Agriculture Innovation Center

### **Orders may be sent to:**

Michele Kaufman, 315 787 2419, [mrk25@cornell.edu](mailto:mrk25@cornell.edu)

Trac Software, NYS IPM Program, 630 West North St., Geneva, NY 14456

Online information is available at <http://www.nysipm.cornell.edu/trac/index.html>

(*Source: New York Berry News, Vol. 4, No. 7 July 15, 2005*)

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## Upcoming Meetings

### **UMass Extension - Weed Identification Workshops**

Correct weed identification is an important first step in the development of an effective weed management program. Using a classroom presentation, potted weed herbarium and weed walk, UMass Extension Specialist Randy Prostak will help participants enhance their weed identification skills. Feel free to bring a weed or two to identify. Workshop held rain or shine (lunch not provided), 9 am - 3 pm.

*4 pesticide contact hours available; MCLP and MCH credits will be offered.*

### **Broadleaf and Grassy Weeds**

August 11 - Cape Cod

### **Grassy Weeds in depth**

Sept. 1 - Amherst

*Cost \$90/person (pre-registration required, space is limited). Registration is first-come, first-served through the mail. For a registration form, go to [www.umassgreeninfo.org](http://www.umassgreeninfo.org) or call (413) 545-0895.*

**Wednesday, August 11, 6:00-8:00 pm—Tour of Small Fruits at Cornell Orchards** *Meet at Cornell Orchard Store, Rt 366, Ithaca.* Show and Tell of the small fruit plantings with Marvin Pritts, Professor of Horticulture and berry specialist at Cornell. Marvin will talk about the production and marketing of some unusual small fruits, such as hardy kiwi berries, currants, gooseberries, and more. Current research going on at CU Orchards with strawberries, raspberries, and other small fruits will also be discussed.

**August 11-14, 2005, The 31st Annual Northeast Organic Farming Association Summer Conference**, Hampshire College in Amherst, Massachusetts. Go to <http://www.nofa.org/conference/2005/index.php> for all registration information and directions. Call 978-355-2853 for more information.

**Tues. Aug.16**, UNH Horticultural Farm Twilight Meeting. Durham, NH. Contact Cheryl Estabrooke (603)862-3200 for more info.Sponsored by University of New Hampshire Cooperative Extension.

**August 17-19, 2005.** NASGA's 8<sup>th</sup> Annual Summer Tour, "Farming on the Urban Fringe" in Fishkill, New York. See article below for more details.

**October 14-15, 2005.** Passive Solar Greenhouse Workshop. 1522 Lefever Lane, Spring Grove, Pennsylvania. **Contact:** Steve and Carol Moore (717) 225-2489.

**October 14-15, 2005.** Highbush Blueberry Council (USHBC) Fall Meeting, Amway Grand Plaza Hotel, 187 Monroe NW, Grand Rapids, Michigan. . **Contact:** 616-885-2000

**December 6-8, 2005.** Great Lakes Fruit, Vegetable, and Farm Market EXPO. DeVos Place Convention Center, Grand Rapids, Mich. [www.glexpo.com](http://www.glexpo.com).

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*Massachusetts Berry Notes is a publication of the University of Massachusetts 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.*