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**EXTENSION**

# Berry Notes

Prepared by the University of Massachusetts Fruit Team

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## Crop Conditions

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#### UPCOMING MEETINGS

**Strawberries:** Harvest is progressing. Weather conditions have made this a very challenging year for strawberries. Significant amounts of Botrytis gray mold and other fruit rot diseases have been reported. Root weevil adults will begin emerging soon. Watch for marginal notching of leaves from nocturnal feeding. See the New England Small Fruit Pest Management Guide for recommended materials, timing and rates. Control measures may be needed in fields that will be carried over for another fruiting season. Renovate or plow down fields as soon as possible after harvest is complete. This will help suppress insect and disease populations that may have built up this season. See article in this issue on strawberry renovation steps. **Blueberries** are approaching harvest. Be sure to check blueberry maggot traps regularly. Early control measures will target both male and female flies before they mate and can help reduce the need for later sprays when berries are closer to harvest. Keep checking for aphids, mentioned last week, as they can vector the blueberry scorch virus. Late varieties may still benefit from fungicide applications to control anthracnose and alternaria fruit rots. Blueberry plants with fruit and few or no leaves indicates that there is *most likely* a root problem caused by insects, diseases, or rodents. Bushes have to be dug up to determine the exact cause and determine the correct remedy. **Raspberries** are also approaching harvest. Some sites may have already started picking early varieties like 'Revielle' and 'Prelude'. Primocanes may also show flagging from infestation by cane borers. These should be cut out below any sign of tunneling. Watch for twospotted spider mites and potato leafhopper, especially in fall fruiting varieties. Powdery mildew may be a significant problem this year with all the rain. See article below for more information on this disease. **Grapes** are past bloom into fruitset. Conditions during bloom were not ideal and there may be some problems with pollination and fruitset in some varieties. Also, powdery and downy mildew are being reported in many vineyards. A vigorous disease management program should be continued at this time of year. See more on this below. Insects that will need attention now are Potato Leafhopper, rose chafer/Japanese beetle and Grape Berry Moth. Cluster thinning and shoot positioning should be underway. **Currants and Gooseberries** harvest is beginning. Powdery mildew is a significant problem in this crop. Also, watch for two-spotted spider mite, potato leaf hopper, currant borer and gooseberry fruitworm. Severe heat may result in fruit drop, especially in gooseberries..

**ENVIRONMENTAL DATA**

The following growing-degree-day (GDD) and precipitation data was collected for a one-week period, June 22, 2006 through June 28, 2006. Soil temperature and phenological indicators were observed on June 28, 2006. Accumulated GDDs represent the heating units above a 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	2006 GROWING DEGREE DAYS		Soil Temp (°F at 4" depth)	Precipitation (2-Week Gain)
	2-Week Gain	Total accumulation for 2006		
<b>Cape Cod</b>	149	762	75°F	5.00"
<b>Southeast</b>	144	771	75°F	5.10"
<b>East</b>	150	828	70°F	3.50"
<b>Central</b>	149	739	65°F	1.53"
<b>Pioneer Valley</b>	163	817	68°F	2.84"
<b>Berkshires</b>	138	720	70°F	2.34"
<b>AVERAGE</b>	149	773	71°F	3.39"

*n/a = information not available*

(Source: UMass Extension 2006 Landscape Message #18, June 30, 2006)

**STRAWBERRY**

**Mites in Michigan Strawberry Fields and Their Management**

*Rufus Isaacs, Michigan State University*

Mites can be significant pests of strawberry, feeding on leaves and reducing the ability of plants to grow, ripen fruit and store energy for the following season. In most Michigan strawberry plantings, mites do not cause economic injury and their abundance is kept in check by predatory mites. However, pest mites can reach levels requiring the application of a miticide when these predators are not present, or conditions are appropriate for the rapid mite development. It is important for strawberry growers to know how to scout for pest and predator mites in their fields, so that damaging populations can be avoided or controlled. Two pest mite species infest strawberry in Michigan: **twospotted spider mite** and **cyclamen mite**.

**Twospotted spider mite**

Twospotted spider mites are the most common mite pest of strawberry and brambles in Michigan. This mite overwinters in and around fields on strawberry and on other broad-leaved plants. The mites start feeding and laying eggs in the spring when temperatures rise, and there are several generations each season. These mites can disperse by "ballooning" in the wind on small silken threads that they secrete while feeding.

The adults are about 1/60 inch in length and yellowish-white with two dark patches. Their eggs are about the same size and are shiny clear spheres, found on the undersides of leaves. They feed by rasping on the underside of strawberry leaves, and this causes strawberry leaves to turn yellow or brown on upper surfaces as feeding continues.



*Photo 1. Twospotted spider mites are found on the undersides of leaves with two dark patches on the body. They are slow moving and may be seen along with their clear spherical eggs and webbing.*

As strawberry rows become green and leaf tissues expand, weekly monitoring for pest and beneficial mites is the best way to ensure that pest mite populations don't reach damaging levels. Mites grow more quickly during warm and dry weather conditions, but there have been years where abundance of these mites was high in Michigan strawberry fields even after cool conditions.

To monitor for twospotted spider mites in strawberry fields, examine 60 trifoliates per field, taken on a zig-zag pattern across the field, and count the number of leaves with mites. A hand lens is a helpful tool for this job. This sampling method saves you having to count the number of mites per leaf; just the presence or absence of mites is determined. If predators are not present, the threshold is 25 percent of leaves infested (15 of 60 leaves), but predatory mites can efficiently reduce pest mite growth at this density. Even one predatory mite per 10 twospotted spider mites is sufficient to control populations without the need for miticides. If predator mites

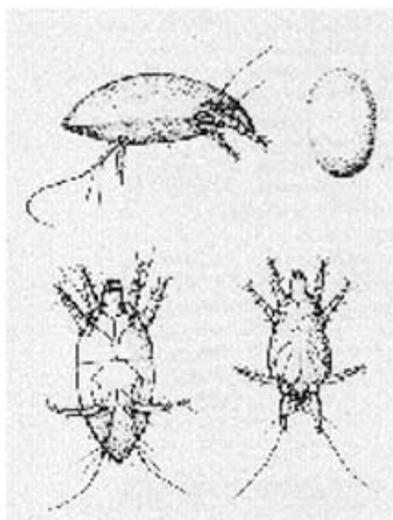
are not detected at this level, a miticide should be applied to protect the plant with application targeting the underside of leaves.

**Cyclamen mite**

The cyclamen mite is tiny and not visible to the naked eye, so a hand lens or microscope is required to see the mites. Mature mites of this species measure only about 0.001 inch long. They are pinkish-orange and shiny and the eggs are translucent. Adult females lay about 90 eggs, 80 percent of which develop into females. Cyclamen mites overwinter as adult females in the strawberry crown and can often be found in this part of the plant before they spread to new tissues. During summer, newly hatched mites develop into mature adults within 2 weeks and populations build rapidly soon after they begin to infest a field. At low population densities, cyclamen mites are usually found along the midvein of young unfolded leaves and under the calyx of newly emerged flower buds. At high population densities, these mites can be found anywhere on non-expanded tissue.

Because cyclamen mites require high temperature and humidity to thrive, they are most common in greenhouses and can be brought to a planting on new plants from greenhouses. Leaves heavily infested with cyclamen mites become severely stunted and crinkled, resulting in a compact leaf mass in the center of the plant. Feeding may also result in flower withering and poor fruit production. Identification of infested transplants before planting is the most effective way of preventing their establishment, and these plants should not be used.

There are no well-developed thresholds for cyclamen mite management in eastern North America, but the University of California recommends monitoring newly unfolding leaves and treating with an appropriate miticide if 1 cyclamen mite is found in 10 leaves. This low threshold is an indication of the potential for this insect to reproduce rapidly and to cause significant injury to plants. If cyclamen mites are found at levels above threshold early in the season, application of a miticide immediately before bloom and 10-14 days



*Photo 2. Cyclamen mites are difficult to see without a hand lens and tend to be found in the tight spaces of plants, particularly in the crown. Photo credit University of Illinois*

later is recommended. Some insecticides registered for control of tarnished plant bug and clipper are also active on cyclamen mites, so the spectrum of pest activity should be considered when selecting a miticide.

**Predatory mites**

Predatory mites can be seen on the underside of leaves, where they actively search the leaf surface for pest mites to eat. In one study in southern Michigan, the predator *Neoseiulus (=Amblyseius) fallacis* was the only species of predator mite present. This mite with a big appetite is a light color and slightly smaller than twospotted spider mite adults. A hand lens is usually required to see them, and their population increase is typically delayed behind that of the pest mites that they feed on.

Preservation of these natural enemies is the best (and cheapest!) way to prevent mite problems, and so growers should

consider using selective insecticides and miticides that do not kill the predators. For example, the commonly-used insecticide Sevin and many pyrethroids have been shown to reduce survival of predator mites. Use of selective products is becoming increasingly possible as more are developed and made available to strawberry growers.

**Miticide options for use in strawberries**

There have been many new registrations of miticides for strawberries in recent years. These miticides vary in the life stage they target, speed and duration of activity, and their pre-harvest interval. The following table is designed to summarize several key variables that can help you determine which miticides registered for use in strawberry are optimal for your Integrated Pest Management program. Selecting a miticide with long residual activity and low toxicity to predators will help provide the best long-term effective control of mites, and there are now some options that can provide this long-term mite control. More information on mite control in strawberry is available in the 2006 edition of MSU’s Fruit Management Guide, publication MSUE-154. This is available online at: <http://web1.msue.msu.edu/pestpubs/E154>

*(Source: Michigan Fruit Crop Advisory Team Alert, ol. 21, No. 12, June 27, 2006)*

**Table 1: Miticides for control of mite pests in strawberry**

Compound	Life stage target*	Resid. Activity (weeks)	PHI(days)	Toxicity to predators***
Savey, hexythiazox	egg/larvae	8-10	3	S
Zeal, etoxazole	egg/larvae	6-8	1	S
Acramite, bifenazate (pH 7)	motiles	6-8	1	S

Agri-Mek, avermectin	motiles	6-8	3	S
Kanemite, acequinocyl	motiles	6-8	1	S
Thiodan, endosulfan	motiles	4-6	4	M
Kelthane, dicofol	motiles	4-6	2	M
Oberon, spiromesifen	egg, motiles	4-6	3	S
Stylet oil**	egg, motiles	4-6	0	S
Vendex, fenbutatin-oxide	motiles	4-6	1	S
Danitol, fenpropathrin	motiles	2-4	2	T

\* Motile forms include mite larvae, nymph and adult stages.

\*\* Organic formulation available.

\*\*\* S = safe, M = moderately toxic, T = toxic to mite predators.

## Strawberry Renovation

*Sonia Schloemann and A. Richard Bonanno, UMass Extension*

Matted row strawberry plantings benefit from a process called 'renovation' after harvest to stimulate new growth to support next year's crop and to interrupt the build-up of certain pests and diseases mid-way through the growing season. For best results, renovation should be started immediately after the harvest is completed to knock down two-spotted mites, sap beetles and/or root weevils and to promote early runner formation. Early runner-set translates to higher yield potential the following year. Build-up of leaf spots and other foliar pathogens can be cleaned up with this process, too. Renovation should be completed by late-July in normal years. The following steps describe renovation of commercial strawberry fields. Specific rates and timing of applications can be found in the New England Small Fruit Pest Management Guide. To order, contact Sonia Schloemann at [sgs@umext.umass.edu](mailto:sgs@umext.umass.edu) or John Howell at [howell@umext.umass.edu](mailto:howell@umext.umass.edu).

1. **Weed control:** Annual broadleaf weeds can be controlled with the 2,4-D amine formulation (Amine® 4 or Formula 40) applied immediately after final harvest. Be extremely careful to avoid drift when applying 2,4-D. Some strawberry damage is also possible if misapplied. Read and understand the label completely. If grasses are a problem, sethoxydim (Poast) will control annual and some perennial grasses. However, do not tank mix Poast and 2,4-D.

2. **Mow the old leaves off** just above the crowns 5-7 days after herbicide application. Be careful not to damage crown by mowing too low.

3. **Fertilize the planting.** The main goal is to deliver nitrogen at this time to help regrow the canopy. Nitrogen should be applied at 25-60 lbs/acre, depending on vigor and basic soil fertility. Split applications (one now and the rest in 4-6 weeks) are better than a single fertilizer application. This gives plants more time to take up the nutrients in the fertilizer. A leaf tissue analysis (recommended once the canopy has regrown) is the best way to fine-tune your fertilizer program. This will tell you what the plants are actually able to take out of the soil and what nutrients are in sufficient supply or not. See Leaf Tissue Test Sampling Instructions at the

UMass Soil and Tissue Testing Lab website at [http://www.umass.edu/soiltest/list\\_of\\_services.htm](http://www.umass.edu/soiltest/list_of_services.htm) for more on this.

4. **Subsoil:** Where tractor and picker traffic has been heavy on wet soils, compaction may be severe. Subsoiling between rows will help break up compacted layers and provide better infiltration of water. Subsoiling may be done as a later step if field conditions are unsuitable.

5. **Narrow rows and cultivate between rows:** Reduce the width of rows to 12-18 inches at the base. More berries are produced along row edges than in row middles. Wider rows lead to lower fruit production (yield and quality) and increased disease pressure. Narrow rows also give better sunlight penetration, air circulation, spray coverage, and over-all fruit quality. Use a roto-tiller, multivator or cultivator to achieve the row-narrowing. Work in the straw between the rows at this time, too. If possible, try to throw 1-inch of soil on top of the rows at this time to stimulate new root formation on established crowns and new runners.

7. **Weed control:** Pre-emergence weed control should begin immediately after the plants are mowed and the soil is tilled to narrow the crop row. The most common practice at this time is to apply half the annual rate of terbacil (Sinbar at 4 oz/acre). It is essential that the strawberry plants are mowed, even if 2,4-D was not applied, to avoid injury from Sinbar. If regrowth of the strawberry plants has started, significant damage may result. Some varieties are more sensitive to Sinbar than others. If unsure, make a test application to a small area before treating the entire planting. Sinbar should not be used on soils with less than 0.5% organic matter or on reportedly sensitive varieties such as Guardian, Darrow, Tribute, Tristar and possibly Honeoye. Injury is usually the result of too high a rate or overlapping of the spray pattern.

If Sinbar is not used, napropamide (Devrinol at 4 lb/acre) or DCPA (Dacthal at 8- 12 lb/acre) should be applied at this time. Dacthal is preferred over Devrinol if the planting is weak. If Sinbar is used, napropamide (Devrinol at 4 lb/acre) should be applied 4 to 6 weeks later. This later application of Devrinol will control most winter annual weeds that begin to germinate in late August or early September. Devrinol should be applied prior to rainfall or it must be irrigated into the soil. During the summer, Poast can be used to control emerged grasses. Cultivation is also

common during the summer months. Cultivations should be shallow and timely (weeds should be small) to avoid root damage to the strawberry planting. The growth of strawberry daughter plants will also limit the amount of cultivation possible especially near the crop row.

8. **Irrigate:** Water is needed for both activation of herbicides and for plant growth. Don't let the plants go into stress. The planting should receive 1 to 1-1/2 inches of water per week from either rain or irrigation.

9. **Cultivate to sweep runners into the row** until plant stand is sufficient. Thereafter, or in any case after September, any runner plant not yet rooted is not likely to produce fruit next year and is essentially a weed and should be removed. Coulter wheels and/or cultivators will help remove these excess plants in the aisles.

10. **Adequate moisture and fertility during August and September** will increase fruit bud formation and improve fruit yield for the coming year. Continue irrigation through this time period and fertilize if necessary. An additional 20-30 pounds of N per acre is suggested, depending on the vigor.

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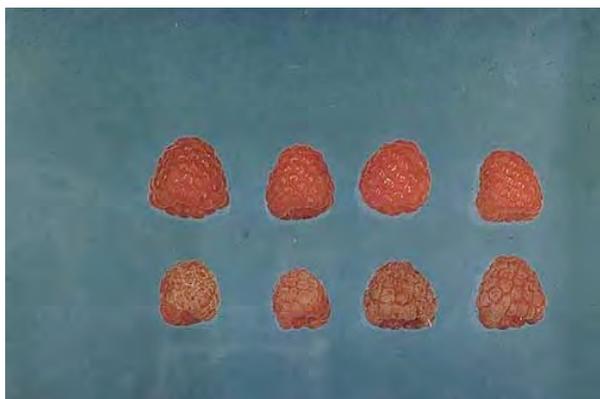
## RASPBERRY

### Raspberry Powdery Mildew

Jay W. Pscheidt, Oregon State University

**Cause:** *Sphaerotheca macularis*, a fungus. Powdery mildew is occasionally a serious disease on foliage, new canes, and fruit of red raspberry in the Pacific Northwest. It also can infect 'Loganberry' leaves. The fungus overwinters as mycelium in dormant buds of stunted cane tips or as cleistothecia. Optimum conditions for spore germination and infection are 65 to 80°F with relative humidity of 97 to 99%. In May, leaves develop lesions that produce fungal spores that are blown to healthy foliage. In June small, secondary-infection lesions appear on vegetative tissue and developing fruit.

Powdery mildew also attacks 'Munger' black raspberry, 'Himalaya', and some other blackberries. The 'Puyallup' red raspberry is very susceptible, so powdery mildew may be a limiting factor with that cultivar. 'Canby', 'Fairview', 'Skeena', and 'Washington' are sometimes



*Powdery mildew on raspberry fruit, Note the lower row of berries are smaller with a dull appearance.*

infected. 'Chilcotin', 'Meeker', 'Nootka', 'Sumner', and 'Willamette' are resistant.

**Symptoms:** A whitish gray powdery coat covers foliage, young growing tips of canes, and fruit. The first

lesions on infected leaves are light green blotches on the upper surface. Severe mildew retards, dwarfs, and distorts plant parts. Infected fruit may become covered with a white, mealy mat of fungus. Severely infected berries fail to size properly and wither and die.

#### Cultural control:

- 1 Plant resistant cultivars.

#### Chemical control:

- 1 Apply dormant or delayed-dormant lime sulfur. Sprays may burn foliage in warm weather.
  - a. Lime sulfur (29 %) at 10 gal/90 gal water. 48-hr reentry. Or
  - b. Sulfurix at 3 gal/100 gal water. 48-hr reentry.
2. Apply first spray when first blossoms open, then weekly until all fruit is set.
  - a. Abound at 6.2 to 15.4 fl oz/A. Do not apply more than two (2) sequential applications or more than three (3) applications per year. May be applied on the day of harvest. 4-hr reentry.
  - b. Armicarb 100 (85% potassium bicarbonate) at 2.5 to 5 lb/100 gal water. Might supplement a normal program when powdery mildew is first observed. Do not mix with acidifying agents. Thorough coverage is essential. 4-hr reentry. Or
  - c. Cabrio EG at 14 oz/A. Do not apply more than twice sequentially or more than four times per year. May be used at harvest. Overuse of this material will lead to resistant fungi, so alternate with other materials. 24-hr reentry.
  - d. Flowable sulfur (52%) at 2.5 gal/A. 24-hr reentry.
  - e. JMS Stylet Oil at 3 to 6 quarts/100 gal water. Do not use with or near a sulfur application. Do not use during freezing temperatures, above 90°F, or

- when plants are under heat or moisture stress. Do not use when foliage is wet as good coverage is essential. 4-hr reentry.
- f. Kaligreen (82% potassium bicarbonate) at 2.5 to 3 lb/A. Might be used to supplement a normal program when powdery mildew is first observed. Do not mix with other pesticides. Thorough coverage is essential. 4-hr reentry.
  - g. Kumulus DF (80% sulfur) at 6 to 12 lb/A. 24-hr reentry.
  - h. Microthiol Disperss (80% sulfur) at 6 to 15 lb/A. Do not use a spreader sticker. 24-hr reentry.
  - i. Pristine at 18.5 to 23 oz/A. Do not use more than 2 consecutive applications or more than 4 times/year. Can be used day of harvest. 24-hr reentry.
  - j. Rally 40 W at 1.25 to 2.5 oz/A. Applications may be made up to the day of harvest. Do not apply more than 10 oz/A/season. Overusing this material leads to resistant fungi, so alternate with other materials. 24-hr reentry.
  - k. Thiolut (80% sulfur) at 6 to 15 lb/A. 24-hr reentry.
- Biological control:** Sonata (*Bacillus pumilis* strain QST 2808) at 2 to 4 quarts/A. May be applied up to and including the day of harvest. 4-hr reentry. (**Source:** [Oregon State University Online Guide to Plant Disease Control](http://www.oregonstate.edu/extension/catalog/items/item.php?id=1010))

## BLUEBERRY

### Monitoring and Management Strategies for the Blueberry Maggot

*John Wise and Rufus Isaacs, Michigan State University*

The blueberry maggot goes through one generation per year, overwintering as a pupa below the soil surface. Most pupae emerge one year after going into the soil, although depending on climatic conditions, a small proportion will remain as pupae through another year or two before emerging. Adult emergence typically begins in mid to late June with adult flight continuing through August.

First adult emergence can be predicted by using a Growing Degree Day (GDD) model, because adult fly emergence should begin at 750 GDD base 50. Actual emergence can be delayed if the soils are dry, as pupae usually respond more readily to a moist environment. Thus, initial adult emergence often follows a rainfall event in late June and in July. After emergence, female flies require approximately 7-10 days to become sexually mature and mate, at which point they will begin laying eggs. Eggs are oviposited under the skin of ripening blueberries with a single egg deposited per fruit. Eggs hatch in about 5 days, at which point the maggot begins feeding, completing their development within a single berry. Upon maturity, the maggot drops to the ground, burrowing up to several inches into the soil before pupating. In Michigan's climate, these pupae will not emerge until at least the following growing season.

Monitoring adult blueberry maggot flight is key to effective protection of blueberries from this pest. Initial adult emergence is best monitored using yellow sticky boards baited with ammonium acetate (or ammonium carbonate) as a food attractant, because newly emerged females are actively feeding during this pre-oviposition period. These traps should be placed on a stake or hung on an upper branch of a blueberry bush in a perimeter row (south facing side of bushes) with enough foliage

cleared from around the trap so leaves don't stick to it. Traps should be deployed before first anticipated flight (late June), since most flies are expected to be immigrating from wild or non-sprayed hosts outside the commercial planting. If a resident fly population is suspected from previous infestation, a trap placed inside the field is a good idea to detect internal infestations. Traps optimally should be checked twice weekly starting 750 GDD50 until the first fly is caught. After the pre-oviposition period is complete, female flies will begin actively searching for fruit to lay eggs in, and there is a trap available that mimics the visual stimulus of a fruit. A green sphere trap, baited with synthetic fruit volatile lure (mixed blend of butyl hexanoate plus other ingredients) can be used to monitor fly activity in fields. Again, these traps should be placed in perimeter rows of the field unless there is evidence of a resident population far in the interior.

Control of the blueberry maggot has been achieved for many years using broad spectrum insecticides. These kill the adult fly on contact and prevent the insect surviving to the point of being able to lay eggs into the fruit. **Guthion** is highly active against blueberry maggot, with long residual activity and has a 7 day pre-harvest interval [Ed. Note: see EPA notification below]. The organophosphates **Malathion** and **Imidan** are also active, with shorter pre-harvest intervals and potential for use closer to harvest. Carbamates such as **Sevin** and the pyrethroid **Asana** are also active on adult fruit flies.

There are several new insecticide products that include blueberry maggot on their labels. The neonicotinoid **Provado** is registered for use in blueberry against Japanese beetle and aphid control, and now also has a supplemental label (<http://www.cdms.net/ldat/ld6AQ003.pdf>) for control of blueberry maggot. Small plot trials of Provado have shown that it protects fruit from this pest, and in large-

scale trials over the past three years in Michigan blueberry farms, we have found no blueberry maggot infestation in fields that were treated with Provado during July and early August.

The spinosyn-containing compounds **SpinTor** (non-organic formulation) and **Entrust** (organic formulation) are highly active on blueberry maggot adults when ingested, but in field trials with high pest pressure and two week application intervals their performance has been rated as good (See accompanying table.). Performance would be expected to be higher in fields with lower pressure and with less time between applications.

**GF120** NF Fruit Fly Bait (spinosad) is registered for control of the blueberry maggot and is listed by the Organic Materials Review Institute (OMRI) for use in organic production. Because the primary route of entry into the insect is through ingestion, applying this

product during the fruit fly pre-oviposition period is important for optimal performance. GF120 must be applied with specialized equipment, and is designed for low-volume application by air. Field efficacy data is encouraging, but we have limited experience with this novel formulation in large-scale trials in Michigan.

The use of **Surround WP** for fruit fly control is based on creating a protective barrier between the plant and the pest that 1) reduces host recognition of the pest, and 2) prevents adult oviposition (i.e.; egg laying). Because it is not toxic to adult flies like conventional insecticides, complete coverage of the plant is critical. Multiple applications are typically needed to attain initial coverage; further sprays may be necessary to respond to wash-off from rain or excessive wind. Field trials indicate that when adequate coverage is maintained that excellent fruit protection can be achieved, although the white residue makes this not suitable for fruit destined for the fresh market. (*Source: Michigan Fruit Crop Advisory Team Alert, ol. 21, No. 12, June 27, 2006*)

Compound Trade Name	Chemical Class	Optimal Spray Timing for BBM	Residual Activity	Effectiveness rating**
Guthion, Imidan	Organophosphates	Within 7 days of the first fly being captured	14+ days	E
Malathion	Organophosphates	Within 7 days of the first fly being captured	5-7 days	G
Lannate, Sevin	Carbamates	Within 7 days of the first fly being captured	5-7 days	G
Asana	Pyrethroid	Within 7 days of the first fly being captured	7-10 days	G
SpinTor, Entrust*, GF120 NF*	Spinosyns	Immediately after the first fly has been captured	7-10 days	F-G
Provado	Neonicotinoids	7-10 days after the first fly is captured	10-14 days	E
Surround WP*	Particle Film Protectant	Multiple applications before fly emergence	As long as thorough coverage of the tree canopy is maintained	E

\* OMRI approved for organic production.

\*\* Effectiveness rating of insecticides (2006 Fruit Management Guide, MSUE bulletin E-154); E – excellent, G – good, F – fair.

### Proposed Phaseout of Pesticide Azinphos-Methyl on Blueberries

*Cathy Heidenreich, Cornell University*

June 9, 2006. To increase protection for farm workers and the environment, EPA is proposing to phase out the remaining uses of azinphos-methyl (AZM). Use on almonds, Brussels sprouts, pistachios, walnuts, and nursery stock will be phased out by 2007, and use on apples, blueberries, cherries, parsley, and pears by 2010.

During the phaseout, EPA is proposing additional restrictions, including reduced annual application rates, additional worker monitoring, and larger buffer zones to help minimize risks. The Agency expects growers of these crops to successfully adopt and transition to the available safer alternatives. All other uses of this pesticide have been voluntarily cancelled by the manufacturer. (*Source: New York Berry News, Vol. 5, No.6, June 19, 2006*)

## Strategies Supportive of Organic Blueberry Production

Kevin Iungerman, Cornell Cooperative Extension

There is great interest on the part of many producers to shift some, or all of their blueberry operation, over to organic practices provided that they can do this economically. Of all the small fruit, the blueberry is a logical strong candidate for such a shift, as blueberries are not subject to a major pantheon of pests as are strawberries or summer raspberries. Earlier this season, Dr. Cesar Rrodriguez Saona and Dean Polk of Rutgers offered a template of approved cultural, behavioral, and chemical insect control strategies, which they believed would be supportive of organic blueberry production in NJ. At points, I will interject some minor caveats, mainly to emphasize climatic and other differences between southern Jersey and our region that might mitigate or otherwise influence adoption here.

1) Regular pruning. Faithful removal of old canes removes overwintering sites of Putnam scale (as well as fungal disease cankers and spores). Adult female scale overwinter under the bark of such canes. (Should be a standard practice for all.)

2) Practice clean cultivation to suppress weeds in and around blueberry fields. It is such ground cover (weeds) that functions as suitable overwintering habitats for cranberry weevil, plum curculio, and other pests. Regular disking and cultivation between blueberry rows will expose both overwintering and active stages of the pests to their natural enemies and also high summer temperatures and suppress weeds. However, even shallow cultivation invites injury to blueberries, which are a very shallow rooted plant, and cultivation pretty well eliminates mulching. Mulch and between row sod helps to mitigate temperature extremes that are less a problem on Jersey's Delmarva soils, which also to not enjoy the slopes -- and erosion concerns -- as we do. Sod can also take up late season moisture and nitrates that otherwise slow wood maturation and hardening off prior to winter. On balance, I think clean cultivation here is a negative.

3) Make use of earlier varieties. Depending upon cultivar bloom date as mediated by its potential but also heat unit accumulation, earlier maturing varieties may nearly escape the broader blueberry maggot infestation window opening to later maturing varieties, whose ripening periods are more in synch with the flies' egg-laying period. Blueberry maggot flies in New Jersey typically begin laying eggs around the 20-22 June. By this date, their early varieties, such as Weymouth, Bluetta, and Earlyblue, have been harvested two or more times, significantly escaping infestation. However, as the name of the game is to stretch the customer season, and because we do have a narrower growing season, I think that early cultivars are a less

viable option here. (Although raised hoop houses with screening could potentially provide a double benefit here: expanded market and maggot deterrent.)

4) Use pheromone traps to monitor cranberry fruitworm, redbanded leafroller, and obliquebanded leafroller populations. Pheromone traps are very useful for timing (and limiting) insecticide applications in all management systems, organic or otherwise. Refer to the 2006 Cornell Pest Management Guidelines for pheromone and baited trap thresholds (Pgs 25 - 29.)

5) Make use of approved pesticides if needed.

- Entrust is reported to have activity against caterpillars, such as cranberry fruitworm and leafrollers, blueberry maggot, and thrips. Entrust is a contact and stomach poison formulation that is a mixture of Spinosyn A and D molecule toxicants from a species of Actinomycete bacteria; it approved for use on organic blueberries by the Organic Materials Review Institute (OMRI).

- Insecticides based on *Bacillus thuringiensis* (Bts) are effective against caterpillar pests.

- Azadirachtin (a botanical, or plant extract) of the neem plant is the basis of Aza-Direct, Agroneem, and Neemix, and are more broad-spectrum than the Bts. They are used against aphids, leafhoppers, thrips, and caterpillar pests.

- Products containing natural pyrethrum (e.g. Pyganic) are effective against blueberry maggot, the most important pest of highbush blueberries. Note that not all pyrethrum products are the same as regards organic usage. Some are not approved because they also contain a synergist, piperonyl butoxide, or are formulated with petroleum-based carriers.

6) Be vigilant of, and control as needed, Leafhopper and Aphid vectors of Blueberry scorch and blueberry stunt viruses.

Blueberry scorch phytoplasma is spread by the feeding activity of several aphids and blueberry stunt is transmitted by sharpnosed leafhoppers. Effective chemical control and aggressive rouging of symptomatic plants are the only viable control strategies at this time. In New Jersey, the botanical pesticide sabadilla and insecticidal soap (e.g. M-Pede) can be effective against leafhoppers (and the soap for aphids), Surround can be used for processing blueberries only, and Neemix is also registered for leafhopper control. Aphids have several natural enemies such as lady beetles, lacewings, syrphid flies, and parasitic wasps. Populations of these natural enemies can keep this as well as other pests below economic thresholds.

Insecticidal soap can be effective against aphids. Fortunately in our region, we rarely deal with virus disease;

unfortunately, we do not have the same range of “organic” chemicals available to us.

7) Keep abreast of applied research innovation. Rrodriguez-Saona and Polk are currently investigating border spray applications of GF-120, a bait formulation of spinosad, which has proteins and sugars known to enhance feeding by adult blueberry maggots. It is registered in NJ exclusively for managing blueberry maggot.

*References: “Insect Management for Organic Highbush Blueberries”, Dr. CesarRrodriguez-Saona, Extension Specialist in blueberry entomology, Rutgers University, Mr. Dean Polk, IPM agent – fruit, Rutgers Blueberry Bulletin Vol. XXIII NO11, June 14, 2006.*

*(Source: The Northeast Fruitlet, Vol. 10 No. 5, June 2006)*

### **Blueberry -- Ripe Rot (Anthracnose)**

*Jay W. Pscheidt, Oregon State University*

**Cause:** *Colletotrichum gloeosporoides* (sexual: *Glomerella cingulata*) and *C. acutatum*, fungi. This disease appears on fruit before harvest (ripe rot) and as a postharvest fruit rot, but control tactics must be implemented earlier in the season. Warm, wet conditions favor disease spread and buildup. Spores are dispersed by splashing rain or irrigation. Infection can occur any time during bloom and berry development. About 10 to 12 hours of continual leaf wetness at 52-80°F is necessary to establish infections. Berry infections remain quiescent (latent) until fruit is nearly mature. The fungus overwinters in blighted twigs and fruit trusses. Pruning and the destruction of prunings from the field did not reduce primary inoculum and has little impact on the resulting disease.

The cultivars such as Bluecrop, Blueray, Bluetta, Earliblue, Herbert, and Spartan are very susceptible while the cultivars Collins, Elliot, and Weymouth are considered resistant.

**Symptoms:** First, blighting of shoot tips; then, a few flowers turn brown or black. Leaf spots, when they occur, are large or small and roughly circular. As infected berries ripen, the flower end may soften and pucker. Under warm and rainy conditions, salmon-colored spore masses form on infected berries. After harvest, spore masses form rapidly on infected fruit when in cellophane-covered baskets or in plastic



*Blueberry Anthracnose: Note the sporulation of the fungus on the side of this berry.*

clamshell packs.

**Cultural control:** A combination of cultural and chemical practices is most helpful in combating losses due to this disease.

- 1 Avoid overhead irrigation or apply such that plants are not wet for extended periods of time.
- 2 Lower the temperature of harvested fruit to 32°F as soon as possible after picking.
- 3 Prune bushes for adequate airflow and to reduce drying time after becoming wet.

**Chemical control:** Apply during bloom and use along with cultural practices. Applications may be needed after bloom in especially wet years. Exclusive use of some products, such as Funginex and Indar, for mummyberry control has resulted in elevated levels of anthracnose. Although this may be an artifact of fungicide testing trials, addition of broad spectrum fungicides in an overall program is recommended.

- 1 Abound at 6.2 to 15.4 fl oz/A. Do not apply more than 2 sequential applications or more than 3 applications per year. May be applied on the day of harvest. 4-hr reentry.
- 2 Cabrio EG at 14 oz/A. Do not use more than 2 sequential applications or more than 4 applications per year. May be used at harvest. 24-hr reentry.
- 3 Captan 80 WDG at 1.25 to 3.1 lb/A plus spreader sticker. May be applied up to day of harvest. Moderately effective. 72-hr reentry.
- 4 CaptEvate 68 WDG at 3.5 to 4.7 lb/A Do not apply more than 2 consecutive application or more than 21 lb/A/season. Can be used day of harvest. 72-hr reentry.
- 5 Ziram products have a moderate to poor control ranking. 48-hr reentry.
  - a Ziram 76 DF at 3 lb/A. Do not apply after 3 weeks from full bloom.
  - b Ziram Granuflo at 3 lb/100 gal water. Do not apply after 3 weeks from full bloom.

**Notes:** Although Aliette is registered for use, it has been effective in only 3 of 9 trials.

Although chlorothalonil products (Bravo and Echo) are registered, their performance has been quite variable and more often ineffective than effective. Since it cannot be used after early bloom, it is not recommended for controlling this disease.

**References:**

Milholland, R.D. and J.R. Meyer. 1984. Diseases and Arthropod Pests of Blueberries. North Carolina Ag Research Service Bulletin 468.

Polashock, J.J., Ehlenfeldt, M.K., Stretch, A.W. and Kramer, M. 2005. Anthracnose fruit rot resistance in blueberry cultivars. *Plant Disease*. 89:33-38. (*Source: [Oregon State University Online Guide to Plant Disease Control](#)*)

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## GRAPE

### Powdery Mildew, Powdery Mildew!

*James Travis, PennState University*

Weather conditions are ideal for powdery mildew infections to occur on newly forming grape berries and cluster stems. Rain is not needed for infection only warm, humid conditions. The wind will blow spores onto susceptible fruit and new leaves once powdery mildew infections are established in the vineyard.

Do not take any chances with fungicide protection. Apply effective powdery mildew fungicides (refer to the [2006 NY & PA Pest Man. Guide](#)). Use plenty of water to get good coverage. When vines are thick and getting thicker every day, penetration of spray inside the canopy can be difficult.



It is important to get canopies separated on Scott Henry and Smart Dyson trellis systems to permit adequate spray coverage and better air circulation. Shoot thinning and cluster thinning are also important.

When you see powdery mildew on the clusters and leaves, it is too late to control the disease. From that point on you will only succeed in limiting the spread and crop loss.

(*Source: Pennsylvania Grape & Barrel Newsletter, Vol. 2, Issue 3, June 2006*)

### Vineyard Floor Management

*Mark Chien, PennState University*

I began to consider the matter of cover crops this spring while visiting many vineyards and seeing every manner of floor management possible, I wondered if there is a standard recommendation for how to best manage the vineyard floor and the precious resources below it.

The variety is as wide as the number of vineyards I have time to visit, from clean cultivation to cover crops over most of the vineyard surface. In general we are taught the benefits of a cover crop system in vineyards, but there can be associated problems as well. Most of the vineyards I see have a somewhat “natural” appearance, meaning the grower has left it up to Mother

Nature to decide what will comprise the cover crop. This usually includes a diverse and substantial broadleaf population which can be viewed from two perspectives – as weeds that are a host for Tomato Ringspot virus or as part of a diverse plant population that promotes beneficial insects. As we drift towards more sustainable practices I believe we will come to accept the latter and learn how to deal with the former.

A cover crop is a non-economic crop that grows in vineyard row middles and sometimes in the vine rows.<sup>1</sup> Cover crops

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<sup>1</sup> *Cover Cropping in Vineyards*. C. Ingels, et. al. 1998. pg 3

basically come in two types – winter or summer annuals that grow and

die within the span of a year or perennial plants that live for more than three years. While we most often think of and use grasses as cover crops they also include legumes like clovers and vetches that might be planted as green manures to add organic matter and nutrients to a soil.

Potential benefits of cover crops include reduced soil erosion, dust and soil compaction, increased N and organic matter, reduced nematode populations, improved soil structure and water penetration, enhanced vineyard access in wet conditions, weed suppression, controlled vine vigor, improved plant diversity and pest management, and the aesthetic appearance. The last benefit is not to be underestimated. I remember from my years as a grower that the vineyard never looks better than right after the grass has been cut. This is a cultural implant that we cannot escape.

The possible problems with cover crops include increased water and nutrient use that may compete with vines, potential host plants for disease, virus and pests, frost hazard, and increased establishment, management, and equipment costs and fossil fuel use.

As in all aspects of vineyard management, there are trade offs involved. It is a classic conundrum on a south slope – should rows go up and down N-S which may increase erosion or E-W, not an ideal vine orientation but less prone to erosion. In Virginia and North Carolina (and probably also in Pennsylvania) an acre of cultivated land loses an average of about eight tons of top soil.<sup>2</sup> This alone may be sufficient justification for using cover crops.

The use of cover crops has been implicated in studies in Germany as a potential contributor to atypical aging of aromatic white wines due to reduced nutrient levels in grape musts and competition for water.

We are only beginning to understand the potential for using cover crops as a viticultural tool to control excess vine vigor. Most vineyard sites in Pennsylvania suffer from too much potential growth from soils that are both very fertile and hold a lot of water, and these conditions combined with frequent summer rains exacerbate vine

growth. Cover crops compete for water and nutrients with the vines and in combination with careful rootstock selection may help to control overly exuberant growth. At Linden Vineyards the cover crop is fine tuned to the point that weed-free circles of various radii are maintained around mature vines depending on their size. Special mowers are used to make sure “weeds” do not grow high and up into the vine canopy making it difficult for workers to do canopy work and creating a more humid canopy microclimate. Cover crops’ influence on vine performance can be regulated (I use this term loosely) by varying the width of the cover crop (and inversely the vine row strip) or using different plant types that have certain performance characteristics. It was suggested to me that C-4 grasses (corn is a C-4 plant), in particular those used to hold soil on slopes by roads, have incredible evapotranspiration capacity and move water out of the soil at enormous rates, thereby helping to reduce vine vigor<sup>3</sup>. Kentucky-31, a tall fescue, is a popular cover crop in Eastern vineyards that grows prolifically in cool, wet weather requiring frequent mowing passes. Since one of my pet projects is to reduce fossil fuel use in vineyards, grasses that require less mowing are more desirable. Common winter annuals for temporary cover crops include annual rye grasses, oats, and barley.



When it comes to the issue of excess vine vigor, I like the use of cover crop and tile drainage with drip irrigation for drought years, particularly for young vineyards. Since fruit quality is tied to vine physiology and all of those functions are directly related to water and nutrient availability, management of these resources is key to controlling the vine and, hence, fruit quality. Short of covering the vineyard after veraison, cover crops may offer the best means to control water and nutrients. I have seen this work in the other direction, too. In Oregon a neighbor had a very weak section of the vineyard with persistently short shoots and yellow leaves. He disced out the cover crop in every other row and it was like magic the way those vines sprang back to life.

Young vineyards and cover crops may be at cross purposes. Young vines need a lot of TLC and that means removing all possible sources of stress. Cover crops (and weeds) can compete with new vines for water and nutrients. If growth is restricted a vine will suffer, root development will be reduced, and vines may suffer long-term ill consequences, manifested by lack of productivity and quality. I have seen new vines in vineyards this spring in exactly this

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<sup>2</sup> *Mid-Atlantic Winegrape Grower's Guide*. T. Wolf and B. Poling. 1995. pp. 40, 41.

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<sup>3</sup> Malcolm Sumner. 2003. Personal communication.

predicament. A dry spring and no irrigation can be a recipe for trouble. This is the reason why new vineyards often clean cultivate for the first year or two

before the establishment of a permanent cover crop. New vineyards with drip irrigation should apply water in two sets per week at 3 gallons per vine per set throughout the growing season.<sup>4</sup> In the fall, a winter cover is planted and disced out in the spring.

If you are going to use a cover crop, I recommend a commercial orchard/vineyard blend of a fescue grass such as creeping red fescue. While difficult and expensive to establish, once it is in place it will offer all the benefits of a cover crop, and its dense root system will help to keep broad leaf weeds from spreading. During dry periods in the summer its growth is very limited, saving valuable mowing passes through the vineyard.

What about the “natural” or resident vegetation? In general, it just doesn’t look as good as a cultivated cover crop. If vineyard aesthetics are important around the winery entrance where visitors roam, then a grass cover is probably the best choice. But as we consider a sustainable vineyard, plant diversity becomes important, and local, non-obnoxious weed species are encouraged. In the Oregon Low Input Viticulture and Enology program, a baseline threshold for number of plant species present in the vineyard is set and penalties assessed if this threshold is not met. In this case, a cover crop may become more of a matter of semantics than aesthetics, referred to as “bio-diversity” instead of weeds. Plant diversity can also be introduced in and around the vineyard to encourage diverse insect populations. This is a common practice in organic vineyards in California where “habitat strips or corridors” are established with a careful selection of plants that attract beneficial insects. These areas are as labor intensive and expensive to maintain as the vineyards they help to protect.

A friend and vineyard consultant in the North Coast told me that nematodes are among the top three considerations in site selection and amelioration in his area (the others are soil pH and total water availability). Plant parasitic nematodes can not only weaken vines through their feeding habits (primarily on young roots) but also transmit viruses like Tomato Ringspot and Fanleaf. Cover crops, used either in a bioremediation program or as part of a more sustainable system, can help to suppress parasitic nematode populations.

Cover crops are an important part of an overall sustainable vineyard management system. They are ever present in vineyards but not always well

considered for both their positive and negative effects. It is a good idea for every grower to approach vineyard floor management in a thoughtful way that will give the best balance to the overall performance of the vines. As with almost every aspect of viticulture, changing one part has downstream effects on a dozen others. It is very important to weigh the pros and cons of cover crops and to use them effectively to achieve your viticultural goals.

#### **Cover Crop Resources:**

*Cover Cropping in Vineyards: A Grower’s Handbook.* Chuck Ingels, et. al. 1998. DANR Publication 3338. Univ of California

*Growing Organic Winegrapes: An Introductory Handbook for Growers.* Ann Thrupp. 2003. Fetzer Vineyards

(*Source: Pennsylvania Grape & Barrel Newsletter, Vol. 2, Issue 3. June 2006*)

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<sup>4</sup> Jeff Newton, Coastal Vineyard Care. 2006. Personal communication.

## Downy Mildew in Grapes

Alice Wise and Wayne Wilcox, Cornell University

How bad Downy Mildew (DM) gets depends on the weather (dry weather is one of the best downy mildew controls), protection on vines prior to the infection periods of this week, and subsequent spray schedule.

Broad spectrum protectants like mancozeb and captan are still very good protectants for downy mildew. Note that the 66 days to harvest limitation for mancozeb products is fast approaching. Ziram and ferbam also are protectants but are not as effective. Abound is rated as very good against downy but past experience dictates that even Abound does not provide complete control under heavy disease pressure. Note that Abound has consistently been far superior to mancozeb in Wayne Wilcox's trials in years with heavy disease pressure. The new registered Pristine has consistently been the top performer in Wilcox's trials. Remember that this is a combination of two fungicides, a strobilurin and something else, but only the strobic component is active against DM. To guard against resistance developing, limit use of all strobic products to a maximum of two or three applications per season. Flint provides only slight control, insufficient when disease pressure is beyond minimal. Bottom line: even with a decent protectant schedule, vigilance is still necessary as are follow up treatments if downy breaks through. Also, no pesticide works well on a raging infection.

Copper, the old standby, is a very good protectant. In local experience, applications to existing infections appear to slow them down, although it doesn't truly eradicate them. Exercise caution with copper for several reasons. First, it is most phytotoxic under humid, slow drying conditions. Do not be lured into a false sense of security if you've never had this enlightening experience. Follow label directions for use of spray lime as a safener. Read the label and the NY/PA Pest Mgt Rec's for grapes for cautions on incompatible spray combinations.

Ridomil is a very effective downy material, the absolute best option for DM control. Given the weather in recent weeks – ideal for DM – Ridomil is the best choice. It is not recommended for use on existing infections due to

the danger of resistance. However, if you haven't abused the privilege in the past and if there are low levels of infection, applying Ridomil will provide both curative control and forward protection. Again, do not use this material on a DM epidemic, you are doing a disservice to yourself and to the industry.

The last option would be one of the phosphorus acid products – Aliette, Prophyt or Phostrol – all of which have post-infection activity and some forward protection. Forward protection is longer on younger leaves (7 days) as PA is very mobile in the plant and travels from older leaves to younger. Fortunately, this is the most susceptible tissue. Downy infects leaves for about a week after they unfold. Older leaves are not susceptible to downy mildew. Applications to existing infections greatly reduce the production of new spores that spread the disease, but they do not completely eradicate the infections.

From Wayne Wilcox's annual disease write up: "There continues to be some confusion about terminology, particularly because several different nutrient solutions also control phosphorous acid to 'promote plant health'. The fact that they promote health by controlling DM, without actually claiming to do so, is one of those gray areas of the law. The bottom line is that phosphorous acid controls DM but doesn't provide P in a form that can be utilized by the plant; in contrast, the phosphoric acid found in traditional fertilizer provides utilizable P but doesn't control DM. Even more ambiguous is that fact that products claiming to be nutrient solutions must state the amount of P that they contain in terms of phosphoric acid equivalents (the nutrient), even if they provide only phosphorous acid (i.e., phosphite, the DM material). Also note that it can be difficult to tell just how much phosphite is in some of these nutrient solutions, and that the rate matters for DM control. Sound confusing? It is. Products like ProPhyt and Phostrol, which are labeled for DM control, are sometimes more expensive than the nutrient solutions but you know just what you're getting [and] their manufacturers stand behind these products for DM control." (*Source: Long Island Fruit & Vegetable Update, No. 16, June 30, 2006*)

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### Upcoming Meetings

**July 12, 2006. Tree Fruit Twilight Meeting**, Windy Ridge Orchard, North Haverhill, NH. The NH Fruit Growers' Association is sponsoring this commercial tree fruit growers' twilight meeting with University of Vermont. UVM and UNH Cooperative Extension Specialists will be discussing pest management options and orchard management. For more info, contact Tom Buob at (603) 787-6944. PAT credits.

**July 13, 2006, Vineyard Canopy Management for Quality Fruit**, UMass Extension Fruit Team Twilight Meeting from 4:00 – 7:00 pm at Sakonnet Vineyards in Little Compton, RI. Featured Speaker is Dr. Andy Reynolds from the

Cool Climate Oenology and Viticulture Institute at Brock University in Ontario, Canada. Cost is \$20 per person. For pre-registration and further information, contact Hilary Sandler at [hsandler@umext.umass.edu](mailto:hsandler@umext.umass.edu).

**July 14, 2006. Massachusetts Fruit Growers Annual Summer Meeting.** UMass Cold Spring Orchard Research and Education Center. Full day program available soon at [www.umass.edu/fruitadvisor](http://www.umass.edu/fruitadvisor). For more information, contact Jon Clements [clements@umext.umass.edu](mailto:clements@umext.umass.edu).

**July 18, 2006. University of Maine - Highmoor Farm Field Day.** Monmouth, ME. For more info, contact David Handley at (207) 933-2100.

**July 20, 2006. Fruit & Vegetable Twilight Meeting,** Perkins Farm, Plymouth, NH. For more info, contact Tom Buob at (603)787-6944. PAT credits.

**July 25, 2006. Grower to Grower Meeting,** Four Corners Farm, South Newbury VT. This meeting, hosted by Haygrove Tunnels, will emphasize strawberries and raspberries. For directions, contact 866-HAYGROVE.

**July 27th, 6:00 PM - Second Annual Celebration of Women in Agriculture -** Cheryl Rogowski, owner of W. Rogowski Farm in Pine Island, NY and MacArthur Foundation Genius Award recipient will speak. Dinner provided. Location: Whatley Town Hall. Please reserve your space by calling CISA at 413-665-7100 or emailing coordinator Therese Fitzsimmons at [therese@buylocalfood.com](mailto:therese@buylocalfood.com). Registration preferred by July 24.

**Aug 9, 2006. Tree Fruit Twilight Meeting,** UNH Woodman Horticultural Research Farm, Durham, NH. Topics will include assessing damage for crop insurance claims and cultural practices to reduce risks. For more info, contact George Hamilton at (603)641-6060.

**Aug. 10-13, 2006. NOFA Summer Conference.** Amherst, MA. To see detailed program information or to register online, visit [www.nofa.org](http://www.nofa.org) or contact Deb Pouech at [nofasc@herbsnhoney.com](mailto:nofasc@herbsnhoney.com) or 860-684-0551.

**August 22-23, 2006 North American Strawberry Growers Association Summer Tour,** Portland Maine. For more information including a full itinerary, visit [www.nasga.org](http://www.nasga.org).

**August 24, 2006 Bramble Field Day,** 3pm – 7pm at Nourse Farms, Whately MA. Enhance your knowledge of bramble diseases and their management through an interactive field day at Nourse Farms. Co-sponsored by UMass Extension and PennState University, this workshop will provide an opportunity to learn about practical methods for identifying common field and postharvest bramble diseases through formal and informal activities. We'll even provide hand lenses that will be yours to keep. We'll discuss sustainable management options including cultural methods and organic fungicides. This meeting will also feature a walking tour of fall raspberry varieties and a review of summer varieties and their performance in 2006. Please pre-register for this meeting by contacting Sonia Schloemann at 413-545-4347 or [sgs@umext.umass.edu](mailto:sgs@umext.umass.edu). There is no fee for this meeting. One contact hour for pesticide recertification credit has been requested. Bring a lawn chair for this meeting. We designed this field day for growers who are intermediate in their knowledge of bramble production. This is a USDA-CSREES/SARE funded event (under SARE grant LNE05-227).

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### **Renewable Energy for Farms and Greenhouses - A Series of Twilight Meetings**

*Sponsored by The University of Massachusetts Extension Agriculture and Landscape Program, Community Involved in Sustaining Agriculture (CISA) and Donald Campbell Associates*

We will be exploring renewable energy systems for farms and greenhouses this summer and fall through a series of twilight meetings. Plan to join us for one or all meetings to learn how alternative energy sources might fit into your business. These meetings will provide information on funding opportunities and feature vendors and experts with a wealth of knowledge and experience. For more information, including opportunities for sponsorship, or to pre-register, contact Tina Smith, Extension Floriculture Program, 413-545-5306, [tsmith@umext.umass.edu](mailto:tsmith@umext.umass.edu) or Ruth Hazzard, Extension Vegetable Program, 413-545-3696, [rhazzard@umext.umass.edu](mailto:rhazzard@umext.umass.edu).

#### **Solar Energy**

Wednesday, July 26, 2006

4:00 pm – 7:00 pm

Riverland Farm, Sunderland, MA

Host: Scott Reed

Riverland Farm grows 11 acres of organic vegetables and U-pick cut flowers on the banks of the Connecticut River in Sunderland, MA. This past winter, Riverland installed solar panels (photovoltaic modules, also known as PV) as an awning to generate solar electricity to power their coolers and farmstand, as well as to provide a dry, shady area for

customers. Other local farmers will be present to discuss their use of PV to power remote water stations, electric fences and drip irrigation.

Additional Speakers:

Mike Kocsmiersky of Kosmo Solar installed the system and will share his expertise.

Bruce Howden, Howden Farm, Sheffield - Howden Farm currently uses a 1.1 kilowatt solar electric system to power drip irrigation for growing fruits and vegetables on their farm

Elizabeth Smith, Caretaker Farm - Caretaker Farm uses stand-alone solar power systems to pump water for their livestock and to supply power for electric fencing.

Don Campbell, Consultant, Donald Campbell Associates - Don will talk about the process of fitting a farm's needs to the types of renewable energy systems currently available including solar hot air systems to supplement heat for greenhouses.

**Wind and Solar Energy**

Thursday, September 7, 2006

3:00 PM – 6:00 PM

Lion Spring Farm, 236 Dedham, St. Dover, MA

Host: Bob Loebelenz

Lion Spring is a small diversified farm, now engaged in the breeding of Massachusetts Thoroughbred horses. The farm also grows vegetables and herbs for local gourmet restaurants and have a collection of chickens who supply farm fresh eggs for retail sales. On site there is a 4.8 kilowatt photovoltaic system and 3.1 kilowatt wind turbine all feeding a battery bank.

Additional Speakers:

Henry Dupont, Lorax Energy Systems on licensing and choosing turbines

Warren Leon, Renewable Energy Trust on state funded opportunities for renewable energy

Don Campbell, Consultant, Donald Campbell Associates

Don will talk about the process of fitting a farm's needs to the types of renewable energy systems currently available

**Field Corn Biomass for Heating Greenhouses**

Wednesday, October 4, 2006

3:00 PM – 6:00 PM

Kosinski Farm, Westfield, MA

Host: Mike Kosinski, Kosinski Farm

Kosinski Farm grows 140 acres of blueberries, apples, grain corn, vegetables and tobacco. Five greenhouses provide flower and vegetable plants for retail sales at their farm stand and use in the field. Blueberries, apples and butternut squash are major wholesale crops.

Mike began heating one greenhouse with his own corn three years ago and has been expanding his use of corn for heat each year. This year he is installing two larger stoves with automated auger stoking systems. Field corn fits well into his vegetable rotation. The corn is dried off-site and trucked back to the farm. His production costs are about \$60-\$65 per ton of corn, which is about one-third of the cost of heating oil (\$2.45 per gal.) based on energy costs per BTU.

Additional Speakers:

Rob Rizzo, Mt. Wachusett Community College - Rob uses a variety of renewable energy sources including wood chips, wind and solar power and has reduced the energy costs at the college by 5%.

Bill Llewelyn, Five Point Farm, Northfield - Bill grows and sells corn for energy use. This season he harvested 1,000 tons of corn.

Christine Serrentino, From Field to Table - Christine will talk about the science and economics of burning corn.

Don Campbell, Consultant, Donald Campbell Associates - Don will talk about the process of fitting a farm's needs to the types of renewable energy systems currently available.

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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.*