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UPCOMING MEETINGS

Message from the Editor:

Strawberries: Strawberry harvest is winding down or finished in most sites. Good picking weather much of this season has translated into good yield for many growers. Things to look out for now include leaf feeding by root weevils (notching along leaf margins) that indicate infestations that need to be controlled on beds to be kept over for another picking year. This leaf feeding doesn't cause significant injury to plants, but feeding by larvae on roots can be serious. Control is easier when adults are present. See more on this in the strawberry section below. Also, fields should be renovated as soon after harvest as possible. Steps involved in this process are outlined in the strawberry section. Last week's article on renovation drew some criticism, especially on the weed management recommendations, so check out the new article. Don't forget about new plantings; keep picking flowers and setting runners, watch out for mites and leaf hoppers. Fertilizer applications are also beneficial at this time of year. **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. Late varieties may still benefit from fungicide applications to control anthracnose and alternaria fruit rots. **Raspberries** are also approaching harvest. Some sites may have already started picking early varieties. Winter injury is likely to reduce overall yield in many locations, but some locations may still see good picking (on short canes!). 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. **Grapes** are into fruitset. Watch for leafhopper, grape berry moth and mite infestations. Japanese Beetles are also beginning to show up and will need to be controlled in most locations. Downy Mildew will begin to show up soon, if it hasn't already. **Currant and Gooseberry** harvest is underway. Yield looks very good. It's nice to have some crops that tolerate cold winter temperatures so well. Watch out for heat waves though, because the often cause serious fruit drop in gooseberries and currants. Gooseberry fruitworm may be found now. See the Cornell Small Fruit recommendations for how to manage this insect. Avoid any pesticide applications during harvest if at all possible, but don't forget to check for buildup of mites, aphids or leaf diseases. These things can be cleaned up after harvest.

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 (*)**	**Accum. Precip (*)**
	1-Week Gain (*)	***Total accumulation for 2005 (*)***	***(°F at 4" depth)***	***(1-Week Gain)***
Cape Cod	273 (144)	747 (768)	70° (75°)	1.00" (0.00")
Southeast	303 (126)	864 (801)	68° (80°)	0.31" (0.30")
East	317 (112)	850 (816)	65° (75°)	1.50" (n/a")
Central	310 (121)	858 (803)	64° (62°)	0.34" (0.31")
Pioneer Valley	314 (110)	987 (879)	71° (69°)	3.27" (0.76")
Berkshires	279 (119)	903 (852)	72° (68°)	1.52" (n/a")

Data from same week in 2004. (Source**: UMass Extension Landscape Message #18, July 8, 2005)*

STRAWBERRY

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.

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 3-5 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 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 later in the sequence if necessary.

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**: Preemergence 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.

Root Weevils In Strawberries: Recognize Them, Take Action

Pam Fisher, Ontario Ministry of Agriculture and Food

Root weevils can be a serious pest on strawberries. Damage can be extensive; a pocket of of damage in a corner of the field can expand and cause devastating losses the following year. Recognizing root weevils and their damage is the first step in preventing this problem. Unfortunately, control is difficult and there are few pesticide options.

The following photos can help you identify root weevils and their damage in the field. There are many good internet sources that provide details on life cycle and biology of these pests. See also Massachusetts Berry Notes, July 18, 2002 for a good article on root weevils and their control in strawberries.

Important facts that affect control

- Root weevil larvae feed on plant roots and crowns. Like most soil born insect pests, there are no labeled insecticides for control of larvae, and very few even being investigated.
- There are several species of root weevils, including the black vine weevil and the strawberry root weevil. They have similar life cycles and habits.
- Root weevils have a wide host range: Japanese yew; hemlock; white cedar; pine; spruce; Euonymus; Rhododendron; grapes and berries. They generally move onto a field from the edges.
- Root weevils can't fly. They walk from crop to crop. Expect them to travel short distances when food is available, but longer distances (several hundred feet) if they need to search for new food sources. Barriers and inhospitable conditions will slow migration to new fields.
- Root weevil adults hide in strawberry crowns and plant debris during the day, and feed mostly at night.
- Adults feed on strawberry foliage. The notches and semi-circles cut out of the leaf edge is characteristic. The injury alone is not serious, but it indicates a potential problem with the larvae next year.

Figure 1: *Adult root weevil.*
There are several species, sizes and colour variations.
All have the same shape, snout, and hard shell.

Figure 2: *Root weevil larvae: these larvae, pinkish white in colour, can be found in spring on strawberry plant roots. They are small, only 1/2- 1 cm in length.*

Figure 3: Larvae are legless, with a brown head capsule.

Figure 4: Damage to strawberry plants. Dead plants are clustered together, with less severely infested plants adjacent to the dead ones.

Control of root weevils

- To suppress root weevils, apply an insecticide labeled for root weevil adults in strawberries. Spray after strawberry renovation, at night, when adults are most active. Renovating the field first will help to expose the adults. Adult weevils are hard to kill. They are secretive. They emerge and are active over extended periods of time. Their body design does not lend itself to control with contact insecticides.

Figure 5: Overview of field with root weevil damage. The problem started at the field edge.

- Strawberry renovation practices should include rototilling. Where weevils are a problem, do not narrow the rows with gramoxone, because the plant debris and undisturbed soil will favour weevil activity.
- Never plant new fields adjacent to older plantings.
- Disc infested fields under as soon as possible after harvest, but leave a trap row or two of the old planting at the edge of the planting to prevent mass exodus from the field.

Unconventional attempts to control root weevils:

- Consider barriers or trap crops that will prevent weevils from moving to the new fields. We think that the plastic lined trenches used for Colorado potato beetle might work.

Figure 6: Leaf notching on strawberry leaves caused by adult weevil feeding.

- Researchers are focussing on use of beneficial nematodes to control root weevil larvae. The beneficial nematodes are available commercially. They must be applied with great care and at specific timings in order to survive the application process and reach the weevil larvae, which they infect.
- A grooved board has been developed to capture and collect adult weevils. Using traps like this could be used to monitor migration of weevil larvae to new fields.

(***Source:*** *Ontario Berry Grower, Vol. 7, July 2003*)

Strawberry Disease Fast Facts – Powdery Mildew

Cathy Heidenreich, NYSAES Cornell University

Most growers are aware of potential disease problems in their fruit plantings, based on prior disease history and current/projected weather conditions. However, a brief review is always beneficial. Links are provided if you want more details.

FOLIAR DISEASES: Powdery Mildew

What: fungal disease caused by *Sphaerotheca macularis*.

When: Powdery mildew occurs sporadically during the growing season, when disease conditions are favorable for infection.

Where: Leaf distortion and discoloration are usually the first signs of powdery mildew infection. Powdery patches of white mycelium develop primarily on lower leaf surfaces. Patches may enlarge and coalesce to cover the entire lower leaf surface. Leaf edges often roll upwards, giving a clear view of the powdery white fungal growth below. Purple to reddish blotches may also appear on lower leaf surfaces. Infected flowers are covered with white powdery mycelium, and may be distorted or killed, depending on infection severity. Fruit set may be reduced as infections cause reduced pollen production and/or low pollen retention. If green fruit are infected, they remain hard and fail to ripen. Fruit may also develop purple blotches similar to those on leaves. Infected areas of ripe fruit are often described as "seedy" in appearance as the smaller seeds in infected areas appear raised from the fruit surface. Infected ripe fruit are soft and pulpy, and may become covered with profuse white mycelia.

How: *S. macularis* overwinters on living, infected leaves. When conditions are favorable, the fungus resumes production of chains of dry, hyaline spores. Conidia are wind disseminated to newly emerging flowers and foliage. Cleistothecia are produced under conditions of cool temperature, short day length, and high humidity. Ascospores are produced by cleistothecia; however, these spores do not appear to play a major role in disease intensification or initiation. Unlike other fungal pathogens, disease development is inhibited by wet, rainy conditions. Infection and spread of *S. macularis* is favored by moderate to high relative humidities and temperatures between 60 and 80 ^{o}F (15-27 ^{o}C).

What to do:

• Good cultural practices may help to lessen the chance of establishment and spread of powdery mildew.

• Select planting sites with care, avoiding areas with poor air drainage.

• Good nutrition is key; avoid excess nitrogen application.

• Planting of less susceptible varieties is also suggested. Strawberry cultivars show a wide variety of resistance to powdery mildew, with many commercial cultivars being highly resistant to infection **(See Appendix of Strawberry Disease Resistance)**.

• It is believed that contaminated transplants are often the primary means of disease initiation in a growing area. Purchase only certified plants from a reputable nursery.

Powdery mildew on leaf tips **conidia chains** **cleistothecia on the lower leaf surface**

Standard nursery practice is to remove leaves from transplants during harvest and packing; this practice lessens the chance of disease introduction, however, inoculum may still be present in crowns.

• Scouting is essential to good powdery mildew control; fungicide applications should begin at the first sign of disease.

• Applications of systemic and protectant fungicides during the growing season will protect fruit and flowers, as well as reduce overwintering inoculum. In areas with a history of the disease, fall control of powdery mildew can greatly reduce both repeat leaf infections and possible flower and fruit infections the following spring.

• Thoroughly cover all above ground plant parts with spray, especially undersides of leaves. (***Source**: New York Berry News, Volume 04, Number 6, June 17, 2005*)

RASPBERRY

Bramble Insect and Mite Pests and Their Management

Greg English-Loeb, Cornell University

We covered most of the relevant arthropod pests of raspberries in the last edition of the electronic newsletter. **Tarnished plant bug (TPB)** and **cane borers** continue to be a threat into the summer; tarnished plant bug nymphs and adults feed on developing fruit and cane borer larvae feed inside canes. TPB overwinters as an adult. In the early spring, these overwintered adults feed and produce offspring on early flowering weed species and move into strawberries. This year's spring generation of nymphs are just becoming adults now and present a threat to both later fruiting varieties of strawberries and summer raspberries among many other crop plants. Given the warm and dry weather it may turn out to be a serious plant bug year so do some scouting. The threshold of TPB in raspberries has not been well worked out, but consider some sort of control if greater than 20 to 30% of flowering clusters have adult or immature TPB.

Potato leafhoppers (both adults and immatures) are also showing up in New York farms. This species overwinters as adults in the southeastern USA and then migrates north in spring and early summer (it does not overwinter. They feed on a lot of different crops including many small fruits like strawberries, raspberries, and grapes. They use their soda-straw like mouthparts to pierce the water conducting vessels of the plant (xylem) and such out water and nutrients. If this were all they did, it probably would not cause much problem. But they also inject saliva into the plant and for some species, this causes a strong reaction in the plant. Typical symptoms include yellowing of leaf margins and distorted and possibly stunted leaves. Different plant species respond differently and some are very sensitive while others are not. Raspberries, grapes, and strawberries are sensitive. The adult potato leafhopper is iridescent green and wedge-shaped while the nymph is usually green and moves sideways in a unique manner when disturbed. If injury to foliage is moderate to severe, control may be necessary. Sevin [carbaryl] and Malathion 57 EC are labeled for potato leafhopper on raspberries but note there is a 7 days to harvest restriction for Sevin but only a 1 day restriction for Malathion.

I should also mention **two-spotted spider mite (TSSM)** as a potential pest. These tiny spider-like arthropods can become very numerous on foliage, causing white stippling

on leaves. They seem to be most problematic in dry sites and/or in mild growing areas such as the Hudson Valley and Long Island. As of a few years ago there is now a miticide registered in New York for control of TSSM (Savey DF). Predatory mites can also provide control of TSSM. These beneficial mites are frequently naturally present in raspberry fields, especially where few broad-spectrum insecticides are used, but can also be purchased from a supply house. For both Savey and predatory mites, it's important to start control actions early before you see lots of severe injury to foliage (bronzing).

As fruit ripens, **sap beetles** can become a problem. There are several species. The most obvious one is some times called the picnic beetle. The adult is black with large white or orange spots. We have also been finding the smaller strawberry sap beetle in summer and fall bearing raspberries. The adult beetles are attracted to damaged or over ripe fruit where they feed and may spread fruit rots. Larvae can also infest the fruit but this generally happens after the fruit is over ripe and not marketable. Malathion 57 EC is labeled for sap beetle in raspberries.

Japanese beetles can also cause injury to raspberry foliage and fruit during July and early August. August is the time that the adult raspberry crown borer makes its appearance. The adult is a very attractive moth that superficially resembles a yellow jacket. You may notice the adults resting on foliage during the day. It's the larvae, though, that cause the major problem. Reddishbrown eggs are placed on foliage in August and September. After hatching, the larvae find a protected place near the base of the cane to spend the winter. The next spring the larvae enter the crown and roots where they spend the next year. In the second year the larvae continue to feed until early summer, at which time they form pupae and then emerge as adults in late summer to start the cycle over again. During the growing season, look for withering, wilting, and dying canes, often with half-grown fruit. Destroying these canes (including the crown area) may help reduce crown borer populations. Guthion is currently labeled for control of crown borer on raspberries (applied to control larvae in spring) but that this registration will likely be lost next year. (***Source**: New York Berry News, Vol. 4, No. 6, June 17, 2005*)

Keep an Eye Out For Bramble Borers

Kathy Demchak, PennState University

Early summer is the time of year to watch for the first symptoms of infestations of various types of borers in brambles. Over the past year, I've gotten quite a few calls from folks who have a borer of one type or another in their brambles, but usually by the time I get the call, the damage is already widespread. At this time of the year, especially on hot afternoons, wilting cane tips - the first sign - are fairly easily seen. When a borer is the problem, at first only a tip here or there is wilted while the rest of the tips appear normal. Once a wilted cane tip is noticed, look for other symptoms to help identify what type of borer is the problem. Symptoms may be two rings of punctures about 1/2-inch apart within the top 8 inches of the cane (raspberry cane borer), a cane swelling up to 3 inches long that is slight at first, but will be more obvious in late stages (red-necked cane borer, or less commonly raspberry cane maggot), or a large hole in the side of the cane (stalk borer, which isn't usually a big problem). There may be more than one type of insect present. Once the area of damage is found, if caught early, the eggs or larvae will still be located within several inches of the injury, so pruning out these canes 4-6 inches below the area of damage is the first step in preventing further damage. Plantings near woods and wild bramble populations are usually affected to the greatest extent.

Wilted cane tips will continue to appear throughout the summer. Sprays that are applied need to be targeted towards the adults, because the larvae are protected inside of the canes. They usually are applied late pre-bloom if damage is widespread, but the culprit should be identified first to ensure that the timing is correct. Keep in mind that some pruning during the summer, with additional pruning of damaged canes during dormant pruning, may be all that is needed.

Canes that died as berries were forming should be checked for signs of tunneling in the cane and crown area. Crown borers (not mentioned above) will cause tunneling in the crown area, but because of the timing of damage, tips may not wilt until damage is advanced. Death of fruiting canes may have a variety of other causes including winter injury or a root rot. (***Source**: PennState Fruit Times, Volume 24, Number 6 June 28, 2005*)

BLUEBERRY

Fruit Fly Control Options in Blueberry

Rufus Isaacs , Michigan State University

Last week's *Fruit CAT Alert* (June 21) contained an article on how to monitor for blueberry maggot. Since then, the first of these flies have been trapped in southwest Michigan at non-commercial blueberry fields. Commercial growers should be monitoring for this pest and making management decisions as the harvest season approaches, to prevent infestation of fruit.

The blueberry maggot is a key pest of blueberries, because infestation of fruit by the larvae of blueberry maggot makes it unmarketable. Although spray programs for other insect pests, particularly Japanese beetle, can make blueberry maggot seem of lower importance late in the season, monitoring for this pest is advisable. Weekly checking of yellow sticky traps can be used to identify when adult blueberry maggot flies are active, and action should be taken soon thereafter to prevent infestation of the fruit. Flies often immigrate into fields from surrounding wild habitats, but infestations can also become established in fields if appropriate controls are not used. Maintaining harvested fruit free of blueberry maggot is essential to prevent this pest from building within a field. This article reviews the currently-available insecticide options for fruit protection against blueberry maggot infestation.

Blueberry maggot larva in a ripe berry

Conventional insecticides

Blueberry maggot flies are highly sensitive to nerve toxin insecticides, and because the flies take seven to ten days to become ready to lay eggs, application of an effective insecticide soon after monitoring traps detect a fly can provide excellent control. The most effective broad-spectrum insecticides are the organophosphates Imidan and Guthion because of their high activity against flies and their length of activity. The carbamates Lannate and Sevin also can provide some control, though their activity and duration of fruit protection is lower than Imidan and Guthion. Asana has proved to have moderate activity on blueberry maggot in our recent trials. The organophosphates Malathion and Diazinon can also provide effective control of fruit flies even though their activity drops within a few days of application. As this list indicates, blueberry maggot can be controlled by most of the conventional insecticides available for use in blueberry.

Note that Guthion is limited to two applications per season in blueberry, and that Lannate cannot be used once a U-Pick planting is open to the public.

New insecticides

In the past few years, some new insecticides that are designated as "reduced-risk" by the EPA have received registration for use in blueberry. Many of these are effective on fruit flies but have little impact on beetles, so their commercial use in Michigan blueberries has so far been limited. However, they have potential fits for use in blueberries if the appropriate pest spectrum is present. Provado (Bayer CropScience) was recently registered for control of blueberry maggot. This insecticide provides knockdown and mortality of flies, with good rainfastness and 1-2 weeks of residual activity. It is also highly active on aphids and provides some control of Japanese beetle.

SpinTor is a Dow AgroSciences product with activity on fruit flies that has performed well in recent trials on commercial blueberry farms, providing over 90 percent reduction in infestation compared to untreated plots. This product works by contact activity and ingestion, so it is important to apply immediately after the first fly is trapped. It is also worth noting that SpinTor requires reapplication after significant rain. A baited formulation of SpinTor, called GF-120, is also registered for blueberry. This product is designed to be applied in large droplets spread across the foliage, and flies come to the droplets to feed and eat a toxic dose of insecticide. This product provided 98 percent fruit fly control in plot trials, but it has had little commercial testing in Michigan due to the lack of activity on Japanese beetle.

Evergreen (MGK) is a pyrethrum insecticide with fast initial knockdown activity against blueberry maggot, though with not more than 1 day of residual activity.

Organic options

The blueberry maggot is one of the insect pests that organic control approaches have shown great promise for. In the past few years, several organic formulations of spinosad, the active ingredient in SpinTor have been registered for blueberry. Entrust and GF-120 Fruit Fly Bait are both organic and these insecticides have shown good activity in

trials performed in New Jersey, though they suffer from a lack of rainfastness.

Many neem-containing insecticides such as Ecozin, Azadirect, and AgroNeem are certified for use in organic blueberry production. These products disrupt insect development and reproduction and may also act as antifeedants. Some formulations may affect fruit finish on ripe fruit, so spraying a test patch is advisable before widespread use. In recent trials in New Jersey, AgroNeem provided slightly less control of blueberry maggot than either Entrust, GF-120 or Pyganic.

Pyganic (MGK) is an organic option for fruit fly control. It is a pyrethrum insecticide that has very short activity, but provides high knockdown and control of adult flies. This product has a short PHI and broad activity.

Surround WP (Engelhard) has demonstrated efficacy against blueberry maggot in multiple research trials in recent years. This refined kaolin clay formulation produces a fine white coating over the bush that may operate to prevent egglaying by irritation of the fly as it searches in the plant canopy. A coating of Surround must be maintained for adequate performance, and reapplication after heavy rain will likely be required. Because this product can leave a residue on the fruit at harvest, it is more suitable for processing berries than for the fresh market.

Comparison of insecticides

The accompanying table provides a broad comparison of insecticides registered for use in blueberry. Blueberry maggot is included along with Japanese beetle and Tussock moth, because blueberry growers are often managing these pests at the same time. The table represents a summary of our experience with these insecticides in Michigan and New Jersey. The greater the number of stars, the greater the activity against the listed pest. This activity is based on a combination of the product's toxicity and longevity. Some of these are not active against some pests (marked 'x'). Others have not been tested in our trials, but we have rated them the grey stars to show expected activity. (***Source**: Michigan State Fruit Crop Advisory Team Alert, Vol. 20, No. 12, June 28, 2005*)

Rating of insecticides for late-season blueberry insect pests

Chemical	Class	REI (hr)	PHI (d)	Japanese Beetle	Blueberry Maggot	Tussock Moth
In season						
Guthion	Organophos.	48	7	***	****	***
Imidan	Organophos.	24	3	***	****	**
Malathion	Organophos.	12	1	**	***	*
Sevin	Carbamate	12	7	***	***	***
Lannate	Carbamate	48	3	**	**	***
Asana	Pyrethroid	12	14	***	***	**
Provado	Neonicotinoid	12	3	**	***	x
SpinTor	Naturalyte	4	3	x	**	**
Entrust▲	Naturalyte	4	3	x	**	**
GF-120▲	Naturalyte	4	3	x	**	x
Confirm	IGR	4	14	x	x	***
Preharvest						
Ecozin ▲	Neem	12	0	*	**	*
Azadirect ▲	Neem	4	0	*	**	*
Neemix ▲	Neem	12	0	*	**	*
Pyganic ▲	Pyrethrum	12	0	*	**	*
Evergreen	Pyrethrum	12	0	**	**	**

triangle = organic, X = not active, grey stars = expected results

GRAPE

Long Island Grape Update

Alice Wise, Cornell Cooperative Extension

Downy Mildew: Downy mildew will likely show up in the coming week. How bad it 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 strobie component is active against DM. To guard against resistance developing, limit use of all strobie 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. 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. (***Source**: Long Island Fruit & Vegetable Update, Vol. 05, No. 16, JULY 1, 2005*)

CURRANTS AND GOOSEBERRIES

Currant and Gooseberry Pests and Their Management

Greg English-Loeb, Cornell University

Imported Currant Worm (ICW) has completed its first generation and is getting started on the second. Larvae are greenish in color with yellowish ends, a black head region, and covered with black spots. Full-grown, they can get to be close to 3 inches long. They initially feed in colonies but as they become larger, feed singly. Malathion is labeled for use against ICW. Other currant and gooseberry pest to be on the look out for in the spring and early summer include the currant borer and gooseberry fruitworm. The currant borer, as an adult, is an attractive moth with clear wings, blue-black body with yellow markings resembling a wasp. The adult emerges in the spring, mates and begins laying brownish eggs on the bark of canes. After hatching, larvae burrow into canes and begin feeding within the pith. No insecticides are labeled for currant borer although removal of weak canes in the spring and fall will help keep populations down. The gooseberry fruitworm is also in the moth group. Larvae feed inside young fruit, sometimes weaving portions of stems together with silk. Finally, two spotted spider mite also feeds on currants and gooseberries and in some years, can cause considerable damage. Look on the underside of leaves for the mites and their webbing. Keep an eye out for reduced plant vigor, bronzing of foliage, and webbing on leaves and shoot tips. (***Source**: New York Berry News, Vol. 4, No. 1, June 17, 2005*)

General Information

Can Plant Pathogens Tell the Difference Between Dew and Rain?

Annemiek Schilder, Michigan State University

A relatively dry season has kept diseases fairly well at bay and lessened the need for fungicide sprays, providing a well-deserved break for growers weary from last year's rainy season. Many diseases currently showing up are from pre-existing infections (e.g., orange rust in brambles, Eutypa dieback in grapes, viruses and Phomopsis canker in blueberries). Is the absence of rain a guarantee against disease development? Read on.

Spore dispersal

Most plant pathogens, particularly fungi and bacteria, require moisture for dispersal and infection, which is why diseases pose more of a problem in rainy years. For many of the diseases we deal with, e.g., powdery mildews, apple scab and black rot in grapes, thorough wetting is required to release the ascospores that cause primary infections. Once the ascospores become airborne, they are carried to susceptible tissues by wind currents. Rain is generally more effective than dew or fog in promoting release of ascospores. Often, within a few hours of the commencement of a light rain or cessation of heavy rain, ascospores are airborne. Greater numbers of ascospores are associated with longer periods of rain. Heavy rains may actually depress the numbers of airborne ascospores by washing them out of the air. In the case of apple scab, discharge of mature ascospores is initiated within 30 minutes after the start of rain and is largely completed within three to six hours. For pathogens with fleshy (e.g., mushroom-like) fruiting bodies, high humidity is often sufficient for release of ascospores.

While dew and fog are generally not sufficient for release of ascospores, overhead irrigation can certainly provide the moisture required. For powdery mildew on grape, rain, sprinkler irrigation or fog can induce ascospore discharge. Interestingly, an apple scab study in Norway showed significant releases of ascospores after some dew events. If a dew event followed a fairly dry period and many ascospores had matured in the meantime, these ascospore release events could constitute at least 10% of total seasonal ascospore discharge. However, dew-induced ascospore release was only considered an infection risk when large numbers of ascospores were released and continued wetness occurred due to poor drying conditions, promoting infection. Otherwise, ascospore release due to dew was more likely to deplete the ascospore supply with no consequent increase in the overall risk of disease.

In the case of pathogens that rely on rain splash for dispersal of spores in all or part of their life cycles (e.g., *Colletotrichum*, *Phomopsis*, bacteria, etc.), dew is a poor substitute for rain. A heavy dew could potentially carry spores or bacterial cells to susceptible tissues by run-off, but the spores would not be distributed very far. However, overhead irrigation can function just like rain in providing splash dispersal of fungi and bacteria. For pathogens with wind-dispersed spores (e.g., *Alternaria, Botrytis*), moisture is only needed to induce sporulation, and the source of the wetness is not very important. In fact, dry, windy conditions following a moist period are more conducive to spore dispersal in this case.

Infection conditions

Once spores have been released and reach susceptible tissues, most fungal pathogens require free water for spore germination and infection of the plant. This is certainly true for pathogens with zoospores (swimming spores) but also most other pathogens, including bacteria. The only exceptions to this are the powdery mildews, which do not need free water for infection and can infect plants between

40 to 100 percent relative humidity. In general, the duration of wetness required for infection varies by the pathogen, temperature and type of tissue it is trying to infect. For instance in strawberries, *Phytophthora cactorum* zoospores can infect fruit within 30 minutes, whereas *Colletotrichum acutatum* needs at least 13 hours of wetness. The moisture required for infection can originate from rain, dew, fog or irrigation water. In fact, frequent or prolonged irrigation during dry weather or for frost protection may increase the chances of infection, especially if the tissues do not dry off between wetting periods. In blueberries, overhead irrigation increases the incidence of fruit rots. It is therefore important to allow overhead irrigation to overlap with natural dew or rainy periods, to reduce plant wetness duration to the minimum time possible.

So for infection, the origin of the wetness does not seem to matter as much as the timing and duration. Now, in the case of downy mildew on grapes, it appears that dew could actually be more conducive than rain in some cases, since the infections take place on the undersides of the leaves and that is where most of the stomata are. Since a light rain may not wet the undersides of leaves well, especially in Labrusca varieties with hairy leaves, dew may be a better source of water for infection. This may explain why we often see downy mildew after heavy dew events, particularly later in the season.

Fungicide coverage

Frequent rains or overhead irrigation can wash protectant fungicides off plant surfaces and thereby decrease or eliminate their protectant ability. Dew or fog are not much of a threat in this regard and may actually serve to redistribute the fungicide over the plant surface a bit. A light dew present when spraying fungicide may increase fungicide coverage, whereas overly wet plant surfaces may actually dilute fungicides and result in run-off. Fungicide wash-off is generally not an issue with systemic products unless rain occurs before the product has dried. However, most systemic products need several hours for maximum uptake into the plant, so a drying time of at least two hours is often recommended. (***Source**: Michigan State Fruit Crop Davisory Team Alert, Vol. 20, No. 11, June 21, 2005*)

Enhancing Beneficial Insects with Native Plants

Anna Fiedler and Doug Landis, Michigan State University

For many years, entomologists have recommended conserving insect predators, parasites and pollinators around the farm or garden to help suppress pests and increase crop yields. But what can you do to promote these beneficial insects? MSU research is investigating the role that native plants may play in helping to enhance the abundance and performance of these helpful arthropods.

Many beneficial predators and parasites (AKA natural enemies) and all pollinators rely on plant nectar and pollen to help sustain them. In addition to these food sources, plants can also provide needed alternative prey and shelter from adverse environmental conditions. For example, one important parasite of the European corn borer in Michigan, the wasp *Eriborus terebrans*, will live for over 14 days in corn fields if provided with a nectar substitute, but only two days if sugar is denied. Further research indicated that these food resources were typically not present in Michigan cornfields but that wasps needed to travel to field edges to find them. Survival of *E. terebrans* was even greater if it could find flowering plants in hedgerow and woodlot edges where temperatures were moderated.

Similar observations have been repeated in various cropping systems with many different types of natural enemies. This has resulted in recommendations for habitat management that include maintaining or planting species that provide floral resources in or near crop fields, orchards and vineyards. One curious fact about these recommendations is that the plants most commonly cited for this purpose, such as buckwheat (*Fagopyrum esculentum)*, sweet alyssum (*Lobularia maritima*), faba bean (*Vicia faba*), dill (*Anethum graveolus*) and coriander (*Coriandrum sativum*) are all annuals and none are native to the United States. We were interested in learning if native Michigan perennial plants could provide similar resources. Furthermore, we wanted to determine if a succession of flowering species could be found that provide floral resources over much of the growing season.

We selected 46 native Michigan plants based on their reported bloom period and ability to survive in agricultural habitats. All of the species selected historically grew in prairie or savanna habitats (scattered trees with an understory of prairie species). Native species were established as plug or 1qt size plants in the fall of 2003 and contrasted to the non-native annuals planted as seed the following spring. During the 2004 growing season, we counted the number of open flowers at each plant species weekly to determine bloom order and time of peak bloom. We also collected, counted and identified natural enemy insects at each plant species weekly during peak bloom.

Results from 2004 showed that plant bloom periods do overlap, which means that we can pick a subset of the most attractive plant species and still provide nectar and pollen to natural enemies during the entire summer. During the early season (May through mid-June), the native cow parsnip (*Heracleum maximum*) attracted three times more natural enemies than the next most attractive plant, the non-native

sweet alyssum. Other attractive native plants blooming in May were Virginia strawberry (*Fragaria virginiana*) and round-leaved ragwort (*Senecio obovatus*). During the mid-season (July through mid-August) the non-native faba bean, buckwheat and coriander were the most attractive plants, followed by the natives yellow giant hyssop (*Agastache nepetoides*) and hoary vervain (*Verbena stricta*). During the late season (mid-August through September), the native boneset (*Eupatorium perfoliatum*) was more attractive than any plant, followed by sweet alyssum and the natives: New England aster (*Aster novae-angliae*), Riddell's goldenrod (*Solidago riddellii*) and smooth aster (*Aster laevis*). The total number of natural enemies in a sample increased dramatically throughout the growing season. During the early season, up to 12 natural enemies were collected per sample, while during the mid-season we collected up to 33 and in the late season up to 83 natural enemies per 30 second sample, respectively.

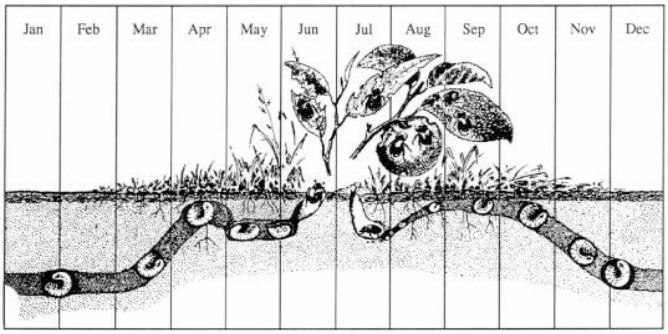
The first full growing season for these perennial plants was 2004. Already in 2005 we are seeing that many species are far more robust and are producing greater floral area than in 2004. As these species mature, it is likely that they may compare even more favorably to the non-native annuals.

While this research is just beginning, we have found several Michigan native plants that are very attractive to natural enemies and show promise for habitat management. On-farm demonstration/research has been initiated to determine if these plants can be reliably established as strips in crop fields and if this translates into improved pest management. An additional benefit of this approach is that while formerly common, many of these prairie and savanna species have almost completely disappeared from our agricultural landscapes. If proven effective, we may once again enjoy the subtle beauty of these native Michigan plants in our agricultural landscapes. (***Source**: Michigan State Fruit Crop Davisory Team Alert, Vol. 20, No. 11, June 21, 2005*)

Japanese Beetle

Richard A. Weinzierl, University of Illinois

Japanese beetles have started to emerge at least as far north as Champaign, and numbers have very high in some southern counties, so it must be time again for my annual piece on this creatures life history and pest status, as well as updates and reminders on its control. The Japanese beetle is an "introduced" pest in North America. It was brought to the United States accidentally in the early 1900s with plant materials from Japan. It has since spread across much of the eastern United States to the Mississippi River, and local populations are established in Texas, Oklahoma, Missouri, and Minnesota. The spread of the Japanese beetle in North America is detailed at this site <http://www.oardc.ohio-state.edu/biocontrol/images/jb_map.jpg>



Japanese beetle larvae - grubs - feed on the roots of a wide range of grasses and can be serious pests of turf. In most of Illinois, the common grub that has damaged lawns and golf courses has been the annual white grub or masked chafer, Cyclocephala spp. It remains unclear whether or not larvae of the Japanese beetle will become as damaging to turf here as populations build. Adult Japanese beetles feed on the fruits and foliage of over 275 different plant species. Among the host plants that they prefer the most are roses, grapes, American linden, cherry, plum, peach, apple, flowering crab apples, Norway maple, and Japanese maple. In small fruit production in Illinois, adult Japanese beetles feed on the foliage of grapes and the foliage and fruits of blueberries and brambles. They also aggregate in mass to feed on fruits of peaches.

Adult Japanese beetles are about 3/8-inch long, with metallic green bodies and coppery-brown front wings ("wing covers"). Five tufts of white hairs (white spots) are visible along each side of the abdomen, and a sixth pair of white tufts are visible at the tip of the abdomen. Larvae are typical C-shaped grubs, with three pairs of legs on the thorax and no legs or prolegs on the abdomen. Newly hatched larvae are about 1/16 inch long; mature larvae are about 1 1/4 inch long. Larvae of the Japanese beetle can be distinguished from larvae of other grub species by the V-shaped pattern of spines (the raster) at the tip of the abdomen.

Mature larvae of the Japanese beetle pupate in the soil in late spring, and adults emerge from June through August; adult emergence begins earlier in the southern portion of the

region. Ron Hines at the University of Illinois Dixon Springs Agricultural Center in the far southern portion of the state has been catching them in traps for 2 to 3 weeks now. Females emit a sex pheromone to attract males, and mating occurs in the turf or other grasses where the female emerges; additional matings occur later on the plants on which adults feed. Adults find a suitable host plant, begin feeding, and both sexes emit an aggregation pheromone to attract other beetles to the same plant. Females, feed, lay eggs in grassy areas, and return to host plants to mate and feed again, completing several cycles of this behavior. Each female lays 40 to 60 eggs.

Because adult beetles can live for several weeks and emergence from pupae spans a period of several weeks as well, Japanese beetle adults may be present from June through October in at least some areas. Larvae hatch from eggs in July, August, and September, and they feed on the roots of grasses until cold temperatures trigger their movement downward in the soil to depths of 4 to 8 inches; they survive prolonged exposure to temperatures of 25 degrees F at that depth with little or no mortality. In the spring, partially grown larvae move upwards in the soil and resume feeding on roots. They pupate in May and June. The Japanese beetle life cycle is available at this Ohio State University Ohioline site.

Management: Biological control agents are available for reducing numbers of Japanese beetle larvae in soil. They include the "milky disease" bacteria Bacillus lentimorbis and Bacillus popilliae and the insect-parasitic nematodes Steinernema carpocapsae and Heterorhabditis spp. However, if the goal is to reduce adult damage to fruit or vegetable crops or ornamental plants, the great mobility of adult beetles limits or negates the value of larval control unless it is practiced on an area-wide basis. Most fruit and vegetable growers must focus on adult control to limit crop losses. Although traps that attract and kill great numbers of Japanese beetles are marketed widely, studies have shown repeatedly that these traps do not reduce beetle populations enough to protect nearby plants, and in some instances damage is greater on plants near traps than on those in areas where traps are not used at all.

Exclusion (by use of plant covers) and the use of insecticides are the only effective options for protecting small fruit crops from Japanese beetle adults. Plant covers (with textures similar to floating row covers) can be practical for protecting small numbers of blueberry plants or a very few small peach or apple trees when fruit is ripening, but covers rarely are feasible for protecting grapes (because sprays for fungal diseases are needed at the same time as protection from Japanese beetles) or brambles (bees are still visiting and pollinating some flowers while ripening fruit is vulnerable to Japanese beetles).

Insecticides labeled for use on blueberries, grapes, and brambles for Japanese beetle control are listed in the 2005 Midwest Small Fruit and Grape Spray Guide. Danitol and Sevin are effective choices for use on grapes until harvest approaches; preharvest intervals are 21 days and 7 days for Danitol and Sevin, respectively. Closer to harvest, malathion is moderately effective and has a 3-day preharvest interval (PHI). Pyrethrins or pyrethrins plus rotenone provide moderately effective control and can be used in organic production. In blueberries, if control is needed it is usually during harvest or very shortly before harvest. Although Asana is effective and labeled for application to blueberries, its 14-day preharvest interval prevents its use when infestations usually occur. Sevin (7-day PHI), malathion (1-day PHI), and pyrethrins or pyrethrins plus rotenone (0- or 1-day PHI) are moderately effective. In brambles, Capture (3-day PHI), malathion (1-day PHI), and pyrethrins or pyrethrins plus rotenone (0- or 1-day PHI) provide adequate control. Several insecticides are labeled for application to apples and peaches for Japanese beetle control. In general, the organophosphates (Imidan and Guthion), carbamates (primarily Sevin), and pyrethroids (several) used in cover sprays aimed at codling moth and other fruit-damaging pests are effective against Japanese beetles as well.

See the 2005 Midwest Commercial Tree Fruit Spray Guide <http://www.extension.iastate.edu/pubs/PM1282/CTFSPBODY.pdf> and specific insecticide labels for rates and restrictions. In peaches, pre-harvest intervals for effective insecticides are: Asana - 14 days, Imidan - 14 days, Guthion - 21 days, malathion - 7 days, Neemix - 0 days, Pounce - 14 days, Sevin - 3 days, and Warrior - 14 days. Sevin is often the best alternative for peach growers as the crop nears harvest. For all these insecticides, the key to adequate control is to scout regularly (once or twice weekly) and treat when damaging numbers of beetles occur on foliage or fruit. Just as important is to scout again beginning a couple of days after treatment to detect reinfestation - something that usually happens with Japanese beetles - and treat again if necessary.

Upcoming Meetings

Jul.11, 2005, Sherman Farm Twilight Meeting. E. Conway, NH. Contact Tina Savage (603)539-3331 for info. Sponsored by UNH Cooperative Extension.

July 11, 2005 Apple Hill Farm Twilight Meeting, 580 Mountain Rd., Concord, NH. Contact George Hamilton 603-641-6060 for info. Sponsored by UNH Cooperative Extension.

July 12, 2005, University of Massachusetts Crops Research Center in South Deerfield, MA 1 Pesticide Recertification Credit. Cost $10. Contact Ruth Hazzard (413-545-3696)

July 18, 2005 Massachusetts Fruit Growers' Association Summer Meeting, Nicewicz Farm 116 Sawyer Road Bolton, MA 10AM – 3PM, cost $10. Jon Clements (413-478-7219)

Tuesday, July 19, 2005 Whitefly Biocontrol on Poinsettias - Information Session at Mahoney's Growing Division, Woburn, MA 10:00 AM - 12:00 PM

Poinsettia growers are invited to join us for an information session on using biological control to manage whitefly at Mahoney's Growing Division, Woburn, MA. Our featured speaker will be Suzanne Lyon, Entomologist, University of Massachusetts-Amherst. Suzanne will talk about how parasitic wasps can be used on poinsettia crops this fall, costs for using parasitic wasps and purchasing and handling parasitic wasps. Suzanne has 8 years experience conducting whitefly biocontrol research on poinsettias and has successfully used biocontrol on poinsettia crops in commercial greenhouses. Karen McNaughton, IPM Scout and Aji Gnanaratnum, Head Grower at Mahoney's will also share their experiences. Four years ago, Aji began using parasitic wasps to manage whiteflies on poinsettias as a participant in the UMass research project. Last year Aji transitioned poinsettia production greenhouses to biological control.
Two contact hours have been approved for pesticide recertification. For more information see http://www.umass.edu/umext/floriculture/ and click upcoming events.

Registration will be accepted by phone, email or mail. To register contact:
Tina Smith, University of Massachusetts, 413-545-5306, tsmith@umext.umass.edu
Paul Lopes, University of Massachusetts, 508-295-2212 ext.24, lopes@umext.umass.edu
Leanne Pundt, University of Connecticut, 802-626-6240, leanne.pundt@uconn.edu

This program is sponsored by a Northeast SARE grant to the University of Massachusetts and University of Connecticut Extension Floriculture Programs as part of the Sustainable Greenhouse Health Maintenance Program.

Jul. 26, 2005, Green Wagon Farm Twilight Meeting. Keene, NH. Contact Carl Majewski (603)352-4550 for info.Sponsored by University of New Hampshire Cooperative Extension.

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
July 27 - Elm Bank, Wellesley
July 28 (bilingual Spanish/English) - Elm Bank, Wellesley
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 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.

Meeting Summary

The Fruit Team twilight meeting at Nashoba Valley Winery (http://www.nashobawinery.com/) in Bolton, MA on June 16, 2005 drew over 50 attendees interested in viticulture with 19 receiving pesticide license recertification credits. There were growers at the meeting from all 6 New England States. There was even a grower from Uzbekistan. Nashoba Valley Winery's J's Restaurant provided wonderful food for the meeting as well as the beautiful setting in their newly constructed event pavilion.

Topics covered at the meeting included

- Pesticide Mixing and Loading – Dr. Bill Coli, UMass Extension
- Vineyard Sprayer Technology – Dr. Andrew Landers, Cornell Univ.
- Basics of Training Systems and Trellis Design – Dr. Bill Nail, Connecticut Ag. Exp. Station
- Vineyard Tractor and Spray Equipment Demo – Orchard Equipment and Supply Co., Conway MA
- Trellis Post Installation Demo – Innovative Fenc e Supply, P almyra NY