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# Berry Notes

Prepared by the University of Massachusetts Fruit Team

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#### UPCOMING MEETINGS

## UP Front FYI:

**New England Small Fruit Pest Management Guide available:** the 2010-2011 edition of the New England Small Fruit Pest Management Guide is available for \$16 (\$12 plus \$4 s&h) and can be ordered through the UMass Fruit Team Website at <http://www.umass.edu/fruitadvisor/fruitsubscriptions.htm> or by contacting your state's Cooperative Extension Specialist.

**North American Strawberry Growers Association Webinar Series continues:** Participation is free, but registration is necessary to participate. Registration is on a first-come-first-served basis for the first 100 participants. To register go to: <http://www.nasga.org/>. All webinars will begin promptly at 1 PM EST and last approximately 1 hour and 15 minutes.

Registrants will receive an e-mail with instructions and a web link prior to each webinar. Simply click on the link to see the scheduled presentations given live by the speakers from his or her location across the US and Canada. Type questions into the chat box provided for real time Q and A with the speakers after the presentations.

#### March 18, 2011

*Strawberry Viruses* - Dr. Robert Martin, USDA ARS, Corvallis Oregon

*Management of the spotted wing drosophila in the small fruits* - Mr. Mark Bolda, University of California Coop Ext, Santa Cruz County.

#### March 25, 2011

*Nematodes and Root Rots* - Dr. James LaMondia, The Connecticut Agricultural Experiment Station.

*Advances in Root Weevil Management* - Dr. Richard Cowles, The Connecticut Agricultural Experiment Station.

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## STRAWBERRY

### Cyclamen Mites on Strawberries

Molly Shaw, Cornell University

Last spring a question came up during a phone call with berry extension specialists around the state—How prevalent are cyclamen mites in our strawberry fields? Summer 2010 presented a perfect chance to find this out in the southern tier. Since we were out taking soil and leaf tests for another project, I simply took another set of leaf samples on strawberry farms to examine for cyclamen mites.

Cyclamen mites are microscopic arthropods (technically not insects, just as spiders are not insects) that hide out in plants and make their living by sucking on plant cells. Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) has a good fact sheet with pictures, <http://www.omafra.gov.on.ca/english/crops/facts/cyclam.htm>.

In the past cyclamen mites have been considered a minor pest of old strawberry fields that ought to have been removed anyway. But in 2010, we found them with surprising frequency in young strawberry fields.

Cyclamen mites live in the crown of the strawberry plant, so you can usually only find them on the newest not-yet-unfolded leaves. Pick a leaf, gently spread it out, and look for almost-microscopic white graininess down by the leaf base. On heavily infested leaves I could see these white grains without a hand lens, but none of the farmers could. To reliably diagnose them you need a good hand lens, and I found a dissecting microscope came in very handy when finding small populations. My typical practice was to pick 25 baby leaves from each strawberry variety and examine them under the scope back at the office.

Strawberry plants heavily infested with cyclamen mites will be stunted with deformed leaves. Interestingly, we found those symptoms on only a handful of plants on a couple farms, while nearly every farm had cyclamen mites on symptomless plants. In fact, of the 8 strawberry farms we sampled, only one was free of the cyclamen mites.

What was even more surprising was that plants just planted in spring 2010 had cyclamen mites, sometimes as

high as 40% of the leaves had mites, but typically they were at a somewhat lower level (10-20%). This suggests that the mites were coming with the plants from the nursery—and most of the growers were using quite reputable nurseries!

So what? You can't see them, customers can't see them, and I just said that it's hard to tell if you even have them by visual symptoms! The threshold for when their sucking activity takes a toll on the plant isn't completely agreed upon. In California, 1 mite in 10 new leaves is considered a potential problem, while Manitoba uses 1 infested leaf in 15 as their threshold for treatment, with the added clarification that when you get to 45-65 mites per leaf it can cause a 1/3 yield reduction. These mites reproduce quickly, from egg hatch to adult in 2 weeks when conditions are right, and females don't need males to lay viable eggs. With this type of exponential growth, going from a couple mites to the levels that cause 33% yield reduction can happen really fast! Besides yield

reduction, the mites can cause general reduced vigor and winter hardiness, compounding problems for the poor plant. Cabot is a variety that some growers love and others can't quite get to perform well after the first year, and coincidentally Cabot had some of the highest mite levels. Could the challenge with Cabot really be a cyclamen mite challenge at its root?

What can you do if you have cyclamen mites? That's the problem, once you have them it's really hard to get rid of them since they reside way down in the protected

crown of the plant. Endosulfan, a strong insecticide, is the only in-field treatment labeled in NY, and the label will end in 2016. It's supposed to be applied after renovation when the leaves have been mowed off, with high pressure and at least 200 gallons of spray/A. Anecdotally, growers haven't found even this treatment to be very effective. (*Editor's Note: [Portal Insecticide/Miticide \(EPA Reg. No. 71711-19\)](#) has a new 2(e) label for use on cyclamen mite in strawberry in NYS. See label for details.*) Usually the best thing to do for a serious infestation is to start over with clean plants.



Photo from Ontario [Crop IPM](#) website

But clean plants from where? This year we found disturbingly high levels of cyclamen mites on 2010 plants, which suggests that they might have come infested from the nurseries, and reputable nurseries at that. Hot water dips for dormant crowns used to be recommended (110 F for 30 minutes, with tight control on the exact temperature achieved), but varieties are different in their heat sensitivity and many new ones haven't been tested.

This is one of those areas where we don't have enough information. Ideally nurseries would have techniques in place to assure that they're shipping clean plants, but that's easier said than done. More research is needed to

establish where the infestations are coming from and to find environmentally sound controls. Juliet Carol from the NYS IPM program has written a grant to do this research, we'll find out if it's funded in March 2011.

In the mean time, take a look at your plants this spring, bring leaf samples to your local extension office where you can use a microscope to examine them, and check out the fact sheet mentioned above for excellent pictures of what you're looking for. The first part of the solution is identifying the problem. (**Source:** *New York Berry News*, Vol. 10 No. 2, February 2011)

### **New series of strawberry cultivars from University of Guelph**

*Pam Fisher - Berry Crop Specialist/OMAFRA*

At the Ontario Berry Growers Association 2011 Annual Meeting, Dr. Adam Dale announced the release of a new June-bearing strawberry cultivar, and new names for two previously released cultivars.

The newest in this series, is 'Summer Ruby'. This variety was tested as 2V55, and released in February 2011. 'Summer Ruby' is a firm, large-fruited, early-mid-season cultivar.

Previously released cultivars V151 and R14 have also been renamed.

V151, released in 2007, will now be known as 'Summer Dawn'. 'Summer Dawn' is an early variety, slightly ahead of Annapolis in season. It is firm, bright-red, and conical in shape, with high



R14, now named Summer Rose Photo credit B. Hughes,

yields. R14, released in 2009, will now be known as Summer Rose. The variety is the latest of the three, similar in season to Serenity. Although slightly smaller but better quality compared to Serenity, Summer Rose is a large, red berry with good but moderate yields.

'Summer Dawn', 'Summer Ruby', 'Sapphire' (released in 2003), and 'Summer Rose' provide growers with four June-bearing, high quality strawberry varieties which are early-, mid-, late-mid- and late-season respectively. The Ontario Berry Growers Association holds the rights to these varieties and they are all available from Strawberry Tyme Farms. (**Source:** *Ontario Berry Grower*, March 2011)

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## **RASPBERRY**

### **Raspberry Harvest Dates and Average Fruit Size 2009-2010 NYSAES, Geneva, NY, Haygrove High Tunnel Planting**

*Courtney Weber, Cornell University*

A rule of thumb for first bloom is 30 days prior to first harvest.

Notice the dates for 2010 were considerably earlier for the primocanes than the 2009 dates. This was due to early warm weather. I believe the floricanes varieties were also affected but by a lesser degree, probably 7-10 days compared to 19 or more days.

I believe the yield decrease in Polka and Jaclyn from 2009 to 2010 is due to their extreme desirability to potato

leafhopper. No other varieties showed symptoms and it was especially bad in 2009, which I believe led to lower yields in 2010. They showed heavy symptoms in 2010 as well.

I expect floricanes yields to be higher in 2011 in the 2<sup>nd</sup> harvest season.

If I were planting I would plant Prelude, Canby and Encore for summer reds, Jewel and Mac Black for black raspberries and Autumn Britten, Himbo Top, Caroline and Heritage for the fall. There is a new very large fruited

variety being released that may be available for spring planting that ripens later than Heritage. It has not been formally announced yet but if there is interest contact Dr. Weber, [caw34@cornell.edu](mailto:caw34@cornell.edu)

Variety problems include small size in Prelude, low cane numbers in Canby and A. Britten (plant at higher density), small size and poor quality in Killarney, very poor flavor in Moutere, average flavor and hard picking in Titan, soft fruit and fire blight in K81-6, root rot susceptibility in Encore, Canby and Titan. Joan J is very dark and

extremely firm (rubbery). Jaclyn is the hardest picking variety I have ever tested. Himbo Top is leggy and needs extra trellising. Polka and Jaclyn have potato leafhopper problems. Heritage is small fruited and average flavored. Caroline is excessively vigorous.

I did not test Lauren. It is root rot susceptible and commonly shows winter damage.

I did not test Josephine because it was unavailable at the time of planting. The fruit quality is very good. The color is dark and it picks hard. It is late. Probably worth a look.

### Floriscane 2010

Variety	First Harvest	Last Harvest	Mean Fruit Size	Yield (lb/ac)
Prelude	Jun 14	Jun 30	2.4g	7,570
Canby	Jun 21	Jul 19	2.9g	7,610
Killarney	Jun 21	Jul 19	2.6g	9,920
Moutere	Jun 22	Jul 26	2.9g	10,240
Encore	Jun 24	Jul 26	3.7g	8,450
Titan	Jun 24	Jul 26	3.9g	6,800
K81-6	Jun 25	Jul 26	4.1g	9,920

### Primocane 2009

Variety	First Harvest	Last Harvest	Mean Fruit Size	Yield (lb/A)
Autumn Britten	Aug 11	Sept 28	3.1g	6,790
Jaclyn	Aug 17	Oct 12	3.1g	10,400
Joan J	Aug 17	Oct 16	2.9g	13,270
Polka	Aug 18	Oct 8	2.6g	10,360
Himbo Top	Aug 18	Oct 16	3.0g	8,730
Caroline	Aug 25	Oct 16	2.5g	10,360
Heritage	Aug 28	Oct 16	2.1g	7,510

### Primocane 2010

Variety	First Harvest	Last Harvest	Mean Fruit Size	Yield (lb/A)
Autumn Britten	Jul 23	Sept 1	3.0g	6,450
Polka	Jul 23	Sept 20	2.8g	8,410
Joan J	Jul 26	Sept 20	2.9g	13,920
Jaclyn	Jul 30	Sept 20	2.7g	4,290
Himbo Top	Aug 2	Sept 17	2.9g	9,520
Caroline	Aug 9	Sept 24	2.5g	10,950
Heritage	Aug 16	Oct 2	1.7g	9,630

(Source: *New York Berry News*, Vol. 10 No. 2, February 2011)

## BLUEBERRY

### Control of Winter Moth Damage in New England Blueberries

*Sonia Schloemann and Robert Childs, UMass Extension*

**Winter Moth** (*Operophtera brumata*): This is a new and important pest of blueberries and other deciduous plants, especially in Southeastern New England. They can severely defoliate bushes. Moths emerge from the soil usually in late November and may be active into January. The male moths are light brown to tan in color and all four wings are fringed with small elongate scales that give the hind margins a hairy or fringed appearance. The female is gray, almost wingless (brachypterous) and,




therefore, cannot fly. Females are usually found at the base of trees or scurrying up tree trunks. Winter moth caterpillars are pale green caterpillars with a white longitudinal stripe running down both sides of the body. They are “loopers” or “inchworms” and have just 2 pairs of prolegs. At maturity, the caterpillars will be approximately one inch long, whereupon they drop to the soil for pupation. Pupation occurs from late May into early June. Winter moth caterpillars are often found in

association with both the fall and spring cankerworms, which look and have similar feeding patterns to the winter moth caterpillar.

**Life Cycle:** After mating, the female deposits eggs loosely in bark crevices, under bark scales, under lichen, or elsewhere. The adult moths then die and the eggs overwinter. Eggs are dark-colored at first but turn orange within 3-4 weeks. In March, just prior to hatching, they turn red and eventually a deep, shiny blue just prior to hatching. Eggs hatch when temperatures average around 55 °F. It is believed that egg hatch in Massachusetts occurs when 20 Growing Degree Days (base 50) have accumulated, which is historically during the second week in April but earlier if temperatures are atypically warmer, depending. This means that egg hatch occurs just at or right before bud break of most of the host plants. After hatching, the larvae wriggle between bud scales of newly swelling buds of such hosts as: maples, oaks, ash, apples, crabapples, blueberry, cherries, etc. and begin feeding.

**Damage:** Caterpillars feed within both flower and foliar buds. Once a bud has been devoured from within, the caterpillar will migrate to other buds and repeat the process. Destruction of the flower buds leads to greatly diminished harvest on fruit crops. Older larvae feed in expanding leaf clusters and are capable of defoliating trees and other plants, when abundant.

**Management:** A dormant oil spray to the trunks and branches of bushes may be helpful to kill the overwintering eggs before they hatch. However, some eggs are under bark flaps and loose lichen and may be protected from oil sprays. Caterpillars may also invade host plants by ballooning onto them after treatment has been applied. Several insecticides are labeled for use against either Winter Moth or Spanworm or both and are outlined in the table below.

<b>Blueberry Bud Stage</b>		
<i>Image Source: Michigan State University Blueberry Facts website.</i>		
 <p><b>Dormant</b></p>	 <p><b>Bud Swell</b></p>	 <p><b>Bud Break</b></p>
<b>Recommendation for Controlling Winter Moth or Spanworm Damage</b>		
Dormant oil, 2-2.5% <b>plus</b> Esteem 35WP, 5 oz/A or Confirm 2F, 16 oz /A or Asana XL, 4.8-9.6 oz/A	Dormant oil, 2-2.5% <b>plus</b> Confirm 2F, 16 oz/A or Delegate 3-7 oz/A or Assail 70WP, 1.9-2.3 oz/A or Asana XL, 4.8-9.6 oz/A or Esteem 35WP, 5 oz/A	Confirm 2F, 16 oz or Delegate 3-7 oz/A or Asana XL, 4.8-9.6 oz or Esteem 35WP, 5 oz

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## GRAPE

### Assessing Bud Injury

Tim Weigle, Cornell University

With temperatures hitting below zero numerous times this season there has been some concern expressed as to how badly the buds have been injured. One comment I have heard is that the best defense is a good offense and more buds will be left up to combat winter injury and to guard against another spring frost. I will leave the discussion of how you need to look at the whole picture and be prepared to thin during the growing season and the effects of over cropping on the vines carbohydrate storage to Terry Bates and Hans Walter-Peterson. I would like to direct your attention to some of the pest management problems that can be caused by leaving up more buds than you need.

**Number 1** - While not specifically a pest management issue, it is an issue of common sense. Most everyone has complained about the job an unsupervised migrant crew does, leaving up too many buds, not leaving up the best buds, etc., leaving you with a mess that requires additional input of man hours in future years to get back to a training system you recognize. Why would you do on purpose what you have tried to avoid over the years?

**Number 2** - Along the same lines as minimal pruning, or hedging (but hopefully not as drastic) will be the number of smaller shoots that come out in the spring quickly filling in the canopy. Take the problem with getting coverage in the interior of the canopy (the fruiting zone) during late season sprays for grape berry moth and move it up earlier in the season due to a quicker closing in of a denser canopy.

**Number 3** - One of my favorites, the law of limiting factors. As you push a vine toward maximum yield you will eventually run into a factor required for getting that crop ripe, while maintaining a healthy vine, that will

become limiting. Powdery mildew is an excellent example of this. When the vines are hanging a moderate to high yield per acre, some powdery mildew on the foliage is not considered to be worth treating, the vine can ripen the crop while building carbohydrate reserves.

However, with an excessive crop, management of late season powdery mildew becomes much more important and will require much more time and effort devoted to it than a vineyard with an appropriate sized crop.

**The Take Home Message is:** do a little detective work to see what you have in the vineyard to get the information necessary to make a good decision. Take the time to check each vineyard block, each variety within a block, and check areas separately if you know they have a tendency to be cold spots.

A guide to checking bud for cold injury can be found at:

<http://www.nysaes.cornell.edu/hort/faculty/pool/budcoldinjury/Assessingbudcoldinjury.html>

If the pictures are a bit small for you try clicking on the picture, it should enlarge the pictures for you. As always, I welcome any questions on vineyard pest management. Just send an e-mail [timweigl@netsync.net](mailto:timweigl@netsync.net), call me at (716) 672- 6830 or drop by the office at 412 E. Main St in Fredonia NY. (*Source: Lake Erie Regional Grape Program Update, March 5, 2003*)

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## GENERAL INFORMATION

### Fruit Fly Don't Bother Me!

Greg Loeb, Cornell University

The In the 2011 January issue of NYBN I mentioned two new invasive insect pests of fruit crops presenting problems for New York Berry Growers: the Brown Marmorated Stink Bug (BMSB) and the Spotted Wing Drosophila (SWD). I featured BMSB last issue so now let's consider SWD.

Spotted Wing Drosophila



*Above, a male Spotted Wing Drosophila fly (Source: Michigan State Crop Advisory Team Alert)*

(SWD) (also known as *Drosophila zuzukii*) looks superficially like your every day Vinegar Fly *Drosophila melanogaster* of genetics fame (and my kitchen in the summer), but Vinegar Flies generally are not a serious economic threat to fruit growers. Female Vinegar Flies typically lay eggs in damaged and/or overripe fruit and hence, are mostly

just a nuisance. On the other hand, female SWD have very robust ovipositors (the rear end portion of the fly used for egg laying) and will lay their eggs in ripe, marketable fruit leading to damage and contamination with maggots (generally not desirable unless you are looking for extra protein in your diet).

As of the 2010 field season there has been no verified reports of SWD in New York, but it seems to be getting closer. SWD first showed up in California in about 2005 and has spread north into Oregon, Washington, and western Canada, south into Florida and recently has been reported at significant numbers in North Carolina and Michigan. Research in the western US indicates that SWD attaches a number of fruit crops with brambles, blueberries, and strawberries perhaps particularly vulnerable because of their softer texture. The first step to developing a management plan for SWD is to detect its presence. Simple cup traps baited with vinegar can be used to monitor for adults and although careful examination under the dissecting scope is required to

identify female SWD, males have diagnostically characteristic spots in the wings. Rufus Isaacs, Fruit Entomologist in Michigan, has a nice fact sheet for SWD that includes excellent photos and also a description of the trap [<http://www.ipm.msu.edu/SWD.htm>]. One interesting observation from the work being done in Michigan is that the abundance of SWD in traps dramatically increased late in the season, well past harvest.

We began monitoring for SWD in a few sites in the Finger Lakes in 2010 without any discoveries and hope to expand monitoring to more sites for 2011 depending on the availability of funding. Delegate insecticide [spinetoram] has a 2ee exemption for use on some fruit crops (bushberries, caneberries, grapes, pome fruit, and stone fruit) in NY for controlling SWD and I anticipate other materials being labeled as the pest becomes established in NY. (*Source: New York Berry News, Vol 10, No. 2. Feb 2011*)

### **Focus on Pest Management Pest Management Update**

*Laura McDermott, and Cathy Heidenreich, Cornell University (adapted for New England)*

There are many new pesticides available for use on berry crops this season. Below is a list of those that have new labels, or a supplemental label within the last year or two. Basic use information is listed to provide the user with an idea of how this product might fit into their pest control arsenal; by no means should a grower rely on these brief statements when applying these materials. As always, please read the label thoroughly and call your extension agent if you have questions.

#### **Herbicides**

Prowl H2O (strawberry) - [Supplemental label](#) for strawberries was approved in 2009 and will expire on Dec. 31, 2011. Supplemental labels are the vehicles that chemical manufacturers must use as they amend the original label, so the hope is that strawberry uses will be added to the Prowl H2O label permanently in 2012. Applicators need to follow instructions on both supplemental and primary labels. See label for special instructions for application of Prowl H2O through sprinkler irrigation systems. Prowl H2O can be used as follows:

Before planting strawberries. Apply to the soil surface before planting to prevent most annual grasses and suppress several broadleaves like velvetleaf or purslane. Irrigate after application to activate herbicide OR shallowly incorporate. Do not apply to soil that will be covered in plastic, but applications to row middles between the beds are allowed. Post transplant applications may be made ONLY if no foliage on dormant plants are exposed to spray. A 2<sup>nd</sup> application

between rows may be applied 35 days before harvest, but material must not come in contact with foliage.

Apply to strawberries in fall or winter dormancy. Do Not apply if new seasonal growth has appeared.

#### **Insecticides/Miticides**

FIFRA Section 2(ee) labels on pesticides mean that they are classified for restricted use only. Any user must have the 2(ee) recommendation in his or her possession at the time of application.

#### **2(ee) registrations include:**

[Danitol 2.4EC 2\(ee\)](#) for Brown Marmorated Stinkbug control on bushberries and strawberry. Danitol 2.4EC can be used at the 0.2-0.3 lb ai/A for bushberries and 0.2-0.4 lb ai/A for strawberries as a foliar spray. Control can be improved by using a non-ionic surfactant and increasing spray volume. Begin applications when 1<sup>st</sup> pest activity is noticed, repeating as needed and increasing rates under severe pest pressure. [Danitol](#) also has a Supplemental label which now includes bushberries and caneberries. Do not use more than 2 applications of Danitol 2.4 EC per season as part of a resistance management program.

[Delegate WG 2\(ee\)](#) for Spotted Wing Drosophila (SWD) suppression on bushberries and caneberries. Delegate WG may be used as part of an integrated program to manage SWD. Use is limited to directed to ground applications at 3-6 oz/A. Use a higher rate for moderate to severe infestations and/or larger plant volume. Begin applications at first sign of adult activity. Occurrence of multiple generations per growing season may require

repeated applications. Follow resistance management recommendations on product label.

[Entrust 2\(ee\)](#) for Spotted Wing Drosophila control on bushberries and caneberries. Entrust should be used as a foliar application at a rate of 1.25 – 2 oz/A.

[Platinum 75 SG Supplemental label](#) – Not for use on Long Island. This insecticide is legal for use on bushberries, low growing berries including strawberries and vining berries (not including fuzzy kiwi). It is not labeled for use on cane berries. The pre-harvest interval is quite long – 50-75 days depending upon the berry category, but because of the granular nature of the product and the fact that you apply early in the season, it may be very handy for growers. Apply a surface band on each side of the row to drip-line. Irrigate immediately after application. Rate varies according to berry crop. This material can provide control or all types of grubs including Japanese beetle. It will also control aphids, leafhoppers and mealybugs.

[Portal 2\(ee\)](#) for Cyclamen Mites for low-growing berries subgroup including strawberries, cranberries, lingonberries (subgroup 13-07G). Apply 2.0 pts per acre in minimum spray volume of 25 gallons water per acre. No more than 4 pints per acre per season. Allow at least 14 days between the 2 seasonal applications. Do not use adjuvants and do not apply through irrigation or by air.

#### **New Registrations include:**

[Actara](#) for all berries to control a wide variety of insects including stink bugs, Japanese beetles, tarnished plant bugs, whiteflies, weevils and aphids. Application rates vary depending upon type of berry targeted, so please refer to the label.

[Altacor](#) for caneberries and climbing vine berries (NOT fuzzy kiwifruit) for the control of omnivorous leafroller and raspberry crown borer. Apply 3.0-4.5 oz/A with a limit of 9 oz/A/season using no more than 3 applications. Allow a minimum of 7 days between applications and use 100-150 gallons water per acre for best results.

[AzaSol](#), a water soluble bio insecticide from Neem can be used on all berries for control of many pests. Rate is 6 oz in 50 gallons of water/A applied as a foliar spray or a soil drench.

[Endosulfan registration To Be Cancelled](#) - Endosulfan is an organochlorine insecticide that has been used on a wide variety of vegetables and fruits. EPA concluded that endosulfan's risks to wildlife and agricultural workers

outweighed its benefits to growers and consumers. EPA is working out the details to terminate all endosulfan uses while considering growers' needs as they change their pest control practices.

[Avaunt](#) had the label expanded in 2010 to include bushberries and cranberries for the control of cranberry fruitworm, cherry fruitworm and winter moth. Avaunt can be applied using overhead irrigation in cranberries only.

[Guthion](#) use on blueberries was restricted in 2010. No aerial applications are allowed and , 1.5 lb maximum application rate. **Note:** Guthion may not be used on highbush blueberries after 9/30/2012.

#### **Fungicides**

[Rampart](#) was labeled for the control of downy mildew, Phytophthora, Pythium and other diseases on blueberries, caneberries, cranberries, currants, elderberries, gooseberries and strawberries. Rampart is a phosphoric acid material that has a wide variety of acceptable application methods which vary according to the disease and crop in question. Please refer to label for details.

[Agri-Fos](#), a phosphorous acid fungicide with systemic properties was labeled for use on strawberries to control leather rot and other Phytophthora diseases. Recommended rate is 1-3 quarts in 50-100 gallons water per acre for foliar spray while 1.25 quarts in 100 gallons of water is the recommendation for a foliar dip when used to control red stele.

[Agri-Star Sonoma 40WSP](#) has been approved for use in caneberries, currants, gooseberries and strawberries to control powdery mildew, rust diseases, leaf spot and leaf blight and gooseberry anthracnose. This material should be used as an early season preventative spray. Rates vary according to disease and fruit, so please refer to label for specific instructions.

[PropiMax](#) was labeled for the control of certain diseases, including leaf spot, rust, mummyberry and powdery mildew on blueberries, caneberries and cranberries. Application rate is 6 fl oz/A and applications should begin when conditions favor disease development or prior to bloom. Do not apply more than 30 fl oz/A per season and not within 30 days of harvest.

A listing of berry crop label alerts may be found at: <http://www.fruit.cornell.edu/berry/labelalerts/>. (*Source: New York Berry News, Vol 10, No. 2. Feb 2011*)

### **Time to inventory your stored pesticides**

*Diane Brown, Michigan State University Extension*

Before the growing season begins, take a look to ensure pesticides are stored properly and in good condition

Properly stored pesticides can have a storage life of

several years, but pesticides do need to be protected from moisture and temperature extremes. Before the next growing season begins is a good time to take inventory of



existing pesticides to evaluate their condition. Water or excess moisture can damage pesticides containers and their contents. Moisture can cause metal containers to rust and paper or cardboard containers to split or crumble. Dry pesticides stored under these conditions may cake or crumble. Slow release products may release their active ingredients.

#### **To prevent water and moisture damage**

- Keep containers securely closed when not in use.
- Place opened bags of dry formulations (wetttable and soluble powders, dry flowables and granules) into sealable plastic bags or clear plastic containers to reduce moisture absorption and prevent spills.
- A jug containing a liquid formulation may be set inside a plastic pan set on the shelf to contain leaks.
- Keep bags off the floor; store on plastic pallets.
- Place metal drums in a drum rack or on a plastic pallet. Direct contact with the floor may make drums more susceptible to rusting.
- Avoid locating a pesticide storage facility in an area likely to flood or where runoff water can be a potential problem.

The normal temperature range for storing liquid pesticides is usually 40° to 100° F.

Protection from temperature extremes is important because either freezing or excess heat can shorten their

shelf life and reduce effectiveness. Low temperatures can cause the product to break down or separate, or the container to rupture. If a pesticide has frozen, contact the manufacturer for specific advice on what to do. Heat expansion of containers may cause them to break or overflow. More specific storage requirements for individual products can be obtained by contacting the manufacturer.

#### **To prevent damage to pesticides from temperature**

- Water soluble packages may attract moisture and become brittle when frozen. Store them in a warm, dry place.
- Storage areas should be insulated or temperature controlled to prevent freezing or overheating.
- Exhaust fans vented to the outside can help reduce temperatures and remove vapors and fumes from the storage area.
- Avoid storing pesticides in direct sunlight to avoid overheating or degradation of products.

*(Source: Michigan Fruit Crop Advisory Team Alert, March 9, 2011)*

## **Tunnel Talk Irrigation Water and Alkalinity**

*Judson Reid, Extension Associate, Cornell Vegetable Program*

Alkalinity can be a serious issue for tunnel growers. What is alkalinity? The quantity of bicarbonate, generally calcium bicarbonate, in irrigation water, measured in parts per million (ppm). High alkalinity is often (but not always) linked to high pH. Many groundwater sources in New York are high in alkalinity. This is not a problem for field production as precipitation is sufficient to leach bicarbonates and acid enough to counteract the alkalinity.

However in tunnels alkalinity can be a problem. As we must irrigate more often than the field, and have no leaching from precipitation, root zone pH will rise over time as bicarbonates accumulate. The high pH can then create nutrient deficiencies such as Iron, Manganese and Boron. Excess Calcium can create Magnesium deficiencies.

What can be done about alkalinity? The first step is to test irrigation water for both pH and bicarbonates with a digital meter. With these two figures we can then use an online calculator from North Carolina State ([www.ces.ncsu.edu/depts/hort/floriculture/software/alk.html](http://www.ces.ncsu.edu/depts/hort/floriculture/software/alk.html)) to calculate a quantity of acid to inject into our irrigation water. The two common acids are phosphoric and sulfuric. Choosing which one will depend on soil nutrient

status, as the addition of acid will also add the respective nutrients to the soil. Thus a soil test is also required.

Organic growers can use citric acid, however there is no tool to calculate the quantity needed. A gradual addition of citric acid to the system while monitoring irrigation water pH is the common approach.

A few notes of caution-acids are dangerous materials! Observe all stated safety precautions. Modifying irrigation water with acid is a preventative measure, and cannot rapidly fix a soil based problem. The quantity of acid required is often very little. Small mistakes, such as an improperly calibrated injector, can lead to big problems. If you are new to this, ask for help. Many greenhouse flower growers have experience with acid injection.

Berry production systems where the tunnel plastic is removed will likely not have to worry about bicarbonate accumulation. For example, if half of a farm's annual precipitation came during the winter months when plastic is not covering the tunnel, root zone pH will likely not be affected by irrigation water alkalinity.

Growers can get started by testing their irrigation water pH with a portable meter. There are many models

available online, or contact your local extension office for suggestions. (Source: *New York Berry News*, Vol 10, No. 2, Feb 2011)

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#### UPCOMING MEETINGS:

**March 15, 16, 2011** – *Maine Vegetable & Fruit School*. Tuesday, March 15 at KEELEY'S BANQUET CENTER, 178 Warren Avenue, Portland, Maine, Wednesday, March 16 at BANGOR MOTOR INN, 701 Hogan Road, Bangor, Maine. For more information please contact: Mark Hutchinson, 207-832-0343 or [mhutch@maine.edu](mailto:mhutch@maine.edu)

**Mar 19, 2011** - *Spring Growth at MOFGA*. MOFGA's Education Center, Unity ME. All day. This year, this annual workshop will focus on managing soil in high tunnels, controlling the high tunnel environment, and crop planning and record-keeping. Featured speakers include Adam Montri from Michigan State University and several farmer experts. For info, contact Eric Sideman at [esideman@mofga.org](mailto:esideman@mofga.org) or 603-269-6201.

**Mar 19, 2011** - *NOFA-NH Winter Conference*. Exeter High School, Exeter NH. Diverse array of topics include Conserving heirloom apples and grafting demonstration (Ben Watson and Gary Nabhan), The Business end of organic farming (Richard Wiswall), and much more. Tracks include small farms, soils, backyard gardening, permaculture, apples/fruits/nuts and more. For info, visit <http://www.nofan.org>, email [winterconference@nofaNH.org](mailto:winterconference@nofaNH.org) or call 603-224-5022.

**March 21, 2011** - *Blueberry School: From Field Management to Value Added Products*. 3:15 - 8:00 pm, Rockingham County Nursing Home Auditorium. North Road, Brentwood, NH. To register, or if you have special needs to attend this workshop, call Deb Stevens or Nada Haddad at 603-679-5616 or email [deb.stevens@unh.edu](mailto:deb.stevens@unh.edu).

**March 30, 2011** - *Farmers' Market Workshops: Food Safety, Consumer Education, and Wine too!* 1:00 pm – 4:00 pm. Burlington Public Library, Burlington, MA. RSVP at least one week prior to the date of the workshop to Martha Sweet at 781-893-8222 or by email: [martha@massfarmersmarket.org](mailto:martha@massfarmersmarket.org).

**April 2, 2011**. Growing Berries in Tunnels and Greenhouses, Cornell Cooperative Extension Office, 480 North Main St., Canandaigua NY 14424. More info at Nancy Anderson (585) 394-3977 x427 or e-mail [nea8@cornell.edu](mailto:nea8@cornell.edu).

**April 26, 2011** – *High Tunnel Berry Production Workshop*. 9am to 4 pm at the Radisson Hotel in Manchester NH. This workshop will provide growers with up-to-date information, and research and extension personnel with information on grower needs. Featuring Kathy Demchak from Penn State Univ. and local Extension staff and grower panel. Pesticide recertification credit offered. Cost: \$30 includes lunch. For more info please contact Suzanne Hebert by phone at 603-862-3200 or email [suzanne.hebert@unh.edu](mailto:suzanne.hebert@unh.edu).

**June 22-26, 2011**. *10th International Rubus and Ribes Symposium, Zlatibor, Serbia*. For more information contact: Prof. Dr. Mihailo Nikolic, Faculty of Agriculture, University of Belgr, Belgrade, Serbia. Phone: (381)63 801 99 23. Or contact Brankica Tanovic, Pesticide & Environment Research Inst., Belgrade, Serbia. Phone: (381) 11-31-61-773.

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